



VCU

Virginia Commonwealth University
VCU Scholars Compass

Theses and Dissertations

Graduate School

2013

Examining the Relations Between the Mental Health and Physical Health of Caregivers of MS in a Mexican Sample

Gillian Leibach
Virginia Commonwealth University

Follow this and additional works at: <https://scholarscompass.vcu.edu/etd>



Part of the [Counseling Psychology Commons](#)

© The Author

Downloaded from

<https://scholarscompass.vcu.edu/etd/3047>

This Thesis is brought to you for free and open access by the Graduate School at VCU Scholars Compass. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of VCU Scholars Compass. For more information, please contact libcompass@vcu.edu.

EXAMINING THE RELATIONS BETWEEN THE MENTAL HEALTH AND
PHYSICAL HEALTH OF CAREGIVERS OF MS IN A MEXICAN SAMPLE

A thesis submitted in partial fulfillment of the requirements for the degree of Master of
Science at Virginia Commonwealth University

By: GILLIAN GOODMAN LEIBACH
Bachelor of Arts, Bates College, May 2009

Director: Director: Marilyn Stern, Ph.D.
Professor
Departments of Psychology and Pediatrics

Virginia Commonwealth University
Richmond, Virginia
May 2013

Acknowledgements

There are several people who I would like to acknowledge and thank for their contributions to my thesis. I would like to thank my committee members, Marilyn Stern, Ph.D., Paul B. Perrin, Ph.D., and Sarah K. Lageman, Ph.D. for their guidance and feedback throughout the process. I sincerely appreciate the time they all spent editing and helping me strengthen my thesis. I would also like to thank Juan Carlos Arango-Lasprilla, Ph.D. for allowing me to use his dataset for this project. Last, I would like to thank my mom, dad, and brother, as well as my friends near and far for their support throughout the preparation of my thesis.

Table of Contents

	Page
Acknowledgements.....	ii
List of Tables.....	v
List of Figures.....	vi
Abstract.....	vii
Introduction.....	1
Rates of Multiple Sclerosis.....	2
Etiology of Multiple Sclerosis.....	3
Caregivers of Patients with Multiple Sclerosis.....	6
Caregiver Physical Health.....	8
Caregiver Mental Health.....	9
Caregiver Burden.....	11
Caregiver Strain.....	12
Social Support in the Context of Caregiving.....	13
Latino Caregivers.....	14
Present Study.....	17
Specific Aims.....	18
Method.....	20
Participants.....	20
Measures.....	24
Procedure.....	27
Analyses.....	28
Results.....	30
Overview of Specific Aims.....	30
Correlation Matrix.....	30
Canonical Correlation.....	32
Moderation Analysis.....	34
Hierarchical Multiple Regression.....	36
Discussion.....	39
Overview of Specific Aims and Findings.....	39
Mental Health and Physical Health.....	41
Demographic Variables and General Health.....	42
Burden and Social Support.....	44
Caregiver Needs.....	46

Positive Aspects of Caregiving for Future Exploration.....	49
Strengths.....	51
Limitations.....	51
Conclusion.....	52
List of References.....	54
Vita.....	62

List of Tables

	Page
Table 1. Demographic characteristics of MS caregivers.....	22
Table 2. Demographic characteristics of the patients with MS for whom caregivers were providing care.....	23
Table 3. Correlations between caregiver mental health and physical health variables.....	31
Table 4. Correlations between caregiver general health and demographic variables.....	32

List of Figures

	Page
Figure 1. Clinical patterns of multiple sclerosis.....	4
Figure 2. The Biopsychosocial Model.....	18
Figure 3. Conceptual model for the canonical correlation.....	33

Abstract

EXAMINING THE RELATIONS BETWEEN THE MENTAL HEALTH AND PHYSICAL HEALTH OF CAREGIVERS OF MS IN A MEXICAN SAMPLE

By Gillian Goodman Leibach, B.A.

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science at Virginia Commonwealth University.

Virginia Commonwealth University, 2013.

Major Director: Marilyn Stern, Ph.D.
Professor
Departments of Psychology and Pediatrics

Evidence suggests that caregiver health affects patient health. Consistent with the Biopsychosocial Model, mental health (anxiety, depression, satisfaction with life, self-esteem), physical health (bodily pain, general health, performance in physical role, physical functioning), burden, and social support were examined in the present study to understand the relations between these variables and the overall health of 81 caregivers of patients with multiple sclerosis (MS) in Mexico. The relation between mental health and physical health was significant. Canonical correlations revealed that depression and general health emerged as primary variables and these were entered into a series of analyses with burden and social support as potential moderating variables. No significant moderations were detected. Hierarchical multiple regressions showed significant relations between demographic and physical health variables, and

three mental health outcomes: anxiety, depression, and self-esteem. Further research should consider the relations between mental health and physical health in the context of Latino culture.

.

Examining the Relations Between the Mental Health and Physical Health of Caregivers of MS in a Mexican Sample

Extensive research has established that the health of a caregiver of someone who is chronically ill has a significant effect on the health of the patient (McKeown, Porter-Armstrong, & Baxter, 2003). While the relation between caregiver and patient health has been studied extensively in the United States and other developed countries, far less attention has been given to the phenomenon in less-developed countries, including Latin American countries such as Mexico. These relations may be even more significant within such populations given the importance of cultural factors, including the primary importance of family among Latino populations (Delgado & Tennstedt, 1997; Nápoles, Chadiha, Eversley, & Moreno-John, 2010).

This paper examines the relation between the mental health (i.e., anxiety, depression, satisfaction with life, and self-esteem) and physical health (i.e., bodily pain, general health perceptions, performance in physical role, and physical functioning) of caregivers of individuals with multiple sclerosis (MS) in Mexico, as well as the roles that burden and social support play in influencing the strength of the relation between mental health and physical health. It begins with an overview discussion of the etiology of MS, including the often prolonged diagnostic process. Tasks and responsibilities involved in caring for individuals with MS are then examined, followed by data evaluating the effects that caregiving for individuals with MS have with regard to mental health and physical health. It is important to note, however, that given the under-diagnosis and under-reporting of MS in Mexico, people caring for patients with MS may face obstacles that are unique to this population that may not be presented in literature collected in other regions of the world. Next, data analyses and results are presented, followed by a discussion regarding the findings in the present study, strengths and limitations, and future

directions for studies and interventions. This research is critical because of the well-known effects of caregiver health on patient health (McKeown et al., 2003) and the importance of investigating additional factors that may impact individuals in less-developed countries.

Rates of Multiple Sclerosis

According to the World Health Organization (WHO) and the Multiple Sclerosis International Federation (MSIF), MS is one of the most common neurological diseases in the world. Globally, approximately 30 in every 100,000 people are affected by MS, and those rates vary by geographical region, with more reported cases in regions that are further from the equator, both north and south. In the United States, the prevalence of MS is 135 per 100,000 people, whereas the prevalence in Mexico is 9 per 100,000 people. For comparison, out of 100,000 people, the following countries have varied prevalence rates: United Kingdom (110), Australia (78), Tunisia (15), South Africa (32), Israel (60), Turkey (34), Hungary (176), India (3), and Brazil (18). Around the world, less-developed and less-served countries tend to have less access to the tests needed to conduct assessments required to diagnose MS (World Health Organization [WHO] & Multiple Sclerosis International Federation [MSIF], 2008), which raises the question of whether there is an under-reporting in some of these regions.

Research on the prevalence of MS in Latin America has had mixed results, but some studies suggest that the rates in Mexico range from anywhere between 5 and 13 people within 100,000 people (Corona & Roman, 2006). There is growing evidence to suggest that there has been an increase in rates of diagnosis of MS in Latin America, including specifically in Mexico (Corona & Roman, 2006). In the 1970s, a diagnosis of MS was rare in Mexico, likely due to under-diagnosing and under-reporting, but by the 1990s, it had become the second most common reason for admission to the neurology ward (Gonzalez & Sotelo, 1995). While it is difficult to

determine why there is an increase in diagnosis, researchers suggest that it is likely due to an improvement in access to services, including diagnostic tools, in this particular region (Gonzalez & Sotelo, 1995).

Etiology of Multiple Sclerosis

There are twice as many women as men diagnosed with MS, and the average age of onset of symptoms is 29.2 years (WHO & MSIF, 2008). Individuals may develop symptoms earlier in life and diagnosis of MS often occurs after symptoms have been present some time because no one single test is available that can detect the presence of this disease. Examination of symptoms over time is also involved in accurate diagnosis of MS (Polman, Reingold, Banwell, Clanet, Cohen, Fillippi et al., 2011).

MS is a chronic, debilitating disease thought to be caused by an inflammatory demyelinating process in the central nervous system, which has no known etiological cause. Myelin surrounds nerves and serves as protection for the nerve fibers in the brain and spinal cord and in MS it is broken down by the body's immune system, which results in discrete areas of demyelination and axonal injury. The deterioration of the myelin disrupts neural transmission along affected axons (O'Connor, 2002), which can cause problems in the way the brain regions communicate, as well as how the brain communicates with the rest of the body. This deterioration varies from individual to individual, which results in heterogeneity among individuals in presenting symptoms as well as course of disease progression (Mayo Clinic, 2010).

There are four types of MS disease classifications based on an individual's disease course. The four types are termed relapsing-remitting MS (RRMS), secondary-progressive MS (SPMS), primary-progressive MS (PPMS), and progressive relapsing MS (PRMS; Chelune,

Stott, & Pinkston, 2008; See Fig. 1.). Relapsing-remitting MS typically refers to symptoms that come and go in the form of attacks, or “exacerbation,” and the lessening or remission of symptoms. The periods between disease relapses are characterized by lack of disease progression. According to Fox and Cohen (2001), approximately 85% of patients who are diagnosed with MS are diagnosed with the relapsing-remitting course of the disease. If the disease is untreated, over the course of 10-15 years, nearly 50% of patients diagnosed with RRMS will develop SPMS (Fox and Cohen, 2001). In SPMS, an initial relapsing-remitting disease course is followed by progression with or without occasional relapses. PPMS typically refers to symptoms that are continuously developing, but in a slower manner and there are no distinct relapses (National Institutes of Health: National Institute of Neurological Disorders and Stroke [NIH: NINDS], 2012). Approximately 10% of patients diagnosed with MS are diagnosed with PPMS (Fox & Cohen, 2001). In PRMS there is progressive disease from onset and the periods between relapses are characterized by continuing progression. This disease course is typically only reported in 5% of patients who are diagnosed with MS (Fox and Cohen, 2001).

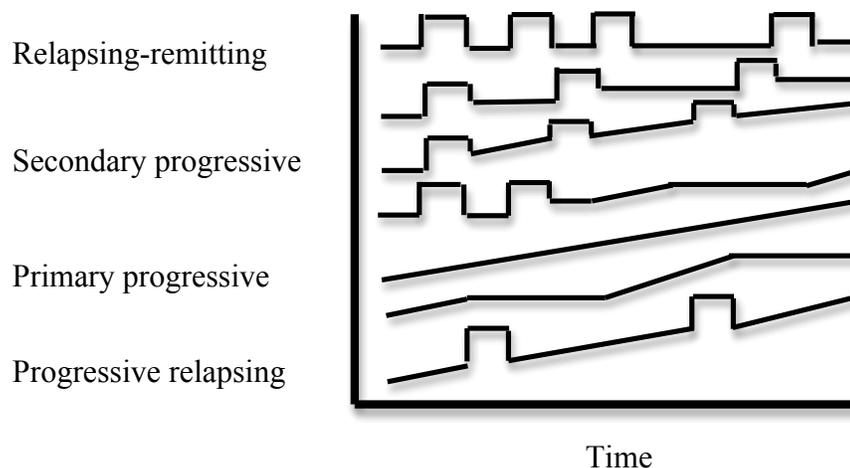


Figure 1. This model provides a visual representation of the four clinical patterns of MS. Adapted from “Multiple sclerosis and other inflammatory demyelinating diseases of the central nervous system,” by M. K. Houtchens, F. D. Lublin, A. E. Miller, and S. J. Khoury, 2008, in *Bradley’s Neurology of Clinical Practice*, p. 1295.

Diagnoses are made based on a series of assessments, including clinical exams and laboratory studies, which commonly involve analysis of cerebrospinal fluid, evoked potentials, and neuroimaging (Houtchens et al., 2008). Doctors and practitioners are responsible for interpreting the results in a collaborative and coherent way to determine whether a diagnosis of MS is appropriate. As a result, individuals with MS and their caregivers have typically experienced a significant period of time of uncertainty regarding their diagnosis and treatment plan. This multi-faceted diagnosis process should also be taken into account when considering the prevalence of MS in less-developed populations where the necessary assessments and access to care may be more constricted.

Symptoms associated with MS are manifested in cognitive, physical, and psychosocial ways, and typically increase gradually across the lifespan. Based on a worldwide study in 2008 that surveyed patients with MS, “motor weakness, dysfunction, or spasticity,” was selected as the most common presenting symptom, which was reported in nearly 50% of the patients surveyed. Approximately 40% of the sample reported sensory problems and fatigue, 31% reported visual disturbances, 22% experienced disturbed balance, 17.5% noted bladder and bowel problems, 15% reported pain, and 10% experienced cognitive or behavioral problems and sexual dysfunction (WHO & MSIF, 2008).

Disease progression in MS is gradual and life-long, and research shows that 60% of those diagnosed are no longer fully able to coordinate motor functions nearly 20 years following symptom onset. Some individuals diagnosed with MS, however, report few severe symptoms across their lifetimes. While many patients with MS live with the illness for most of their lives, some research suggests that these individuals have an average lifespan that is 82.5% of the normal lifespan (Houtchens et al., 2008). Given the lengthy diagnosis process, the progressive

symptoms, and the fact that MS is a life-long disease, caring for someone with this illness can have a profound and evolving effect on a caregiver's own physical and mental health.

Caregivers of Patients with Multiple Sclerosis

Caregivers of patients with chronic illnesses have been studied for years. In MS, we know that caregivers are most often family members (Akkuş, 2011; Buhse, 2008), and in particular, they are more likely to be spouses of the patients because of the average age at which the disease is typically diagnosed (Khan, Pallant, & Brand, 2007). In addition, males are more likely to be caregivers because most people diagnosed with MS are females (Kristjansson, Aoun, & Yates, 2006). MS presents a unique set of challenges for caregivers given the disease's progression and variability.

Buhse (2008) reviewed literature on caregivers, including those caring for an individual with MS, and indicated that spouses tend to experience a "sense of loss" when their partners are diagnosed with MS. There are also gender differences in feelings related to MS when a partner is diagnosed with the illness (Courts, Newton, & McNeal, 2005). The researchers found that men tended to experience more feelings of anger toward the system (e.g., inaccessibility of certain places when their spouses needed wheelchairs), while women more commonly reported emotional distress and experiencing the pain that their spouses were enduring. Mutch (2010) conducted a qualitative study in the United Kingdom and found that spousal caregivers felt as though they needed to place the health of their spouses above their own, and that their roles shifted from spouse to caregiver. These spouses endorsed feeling out of control and guilty in terms of caring for their sick spouses and balancing their own needs and independence concurrently.

Finlayson and Cho (2008) surveyed spousal and non-spousal caregivers of MS in the United States. Non-spousal caregivers included children and “other” caregivers, but the latter were not specifically mentioned (e.g., hired care) in this study. Additionally, the authors asked caregivers whether or not there were other caregivers who helped the patient with MS. They found that nearly two-thirds of the sample indicated the presence of one or more additional caregivers. This is an important distinction that should be considered in this study. Based on the demographics that were reported, the sample included a mix of individuals with MS with different levels of disease severity. “Health characteristics,” however, did not vary between the individuals who were cared for by a spousal versus a non-spousal caregiver. The authors interpreted disease severity based on a question that asked participants to what degree their symptoms interfere with daily activities. The responses included: very minimal (23.1%), minimal (29.0%), moderate (18.9%), and severe (29.0%). Unfortunately, data were not collected that categorized each participant’s course of MS (e.g., relapse-remitting, primary progressive).

The researchers also found that the caregivers spend, on average, approximately 2.8 hours caregiving per day. Nearly 50% of the caregivers reported providing less than one hour per day, 30% reported providing between one and 3.5 hours per day, and 20% reported providing more than 3.5 hours of care per day. The most common activities caregivers reported engaging in include preparing a hot meal (72.3%), providing transportation (69.4%), doing heavy housework (43.7%), doing light housework (42.7%), helping the patient move around inside the house (43.0%), and helping the patient get dressed (41.2%). While many activities are performed multiple times per day, the ones that were completed less often by caregivers include assisting the patient with managing bowels (21.2%), getting in and out of shower or tub (24.9%), managing bladder (24.2%), getting on and off the toilet (11.0%), and assisting with eating

(9.0%). In addition, spousal caregivers spent more hours providing care to their spouses with MS, and they provided more assistance with more activities than non-spousal caregivers. Researchers also found that the spousal caregivers in this study were significantly older than the non-spousal caregivers (Finlayson & Cho, 2008). This research suggests that there may be some unique processes and duties that are faced by female caregivers compared to male caregivers and spousal caregivers compared to non-spousal caregivers of MS, and these differences are important to understand in the present study due to the familial obligations that are often faced by Latino caregivers.

Caregiver Physical Health

Research indicates that caregivers of individuals with MS report significantly worse physical health than non-caregivers (Argyriou, Karanasios, Ifanti, Iconomou, Assimakopoulous, Makridou et al., 2011; Aronson, 1997; Giordano, Ferrari, Racide, Randi, Bisanti, & Solari, 2012; McKeown et al., 2003). Specifically related to this population, one study compared caregivers of MS to matched controls in a European sample. They found that caregivers of MS had significantly lower scores on several scales of the SF-36, including vitality (Giordano et al., 2012). Aronson (1997) conducted a study in Canada that looked at quality of life among caregivers of individuals with MS. In this study, caregivers reported the lowest scores on the health component of the quality of life measure.

In another study, researchers surveyed caregivers of individuals with MS and found that 72% of the caregivers reported that they would be unable to continue providing care to the patient if their own health began to deteriorate (Wollin & Sato, 2001). Similarly, Gupta, Goren, Phillips, and Stewart (2012) identified greater activity impairment in caregivers of MS compared to noncaregiver controls. Argyriou et al. (2011) conducted a study in Greece that examined the

quality of life and emotional burden of caregivers of patients with MS. They found that nearly 32% of caregivers reported experiencing discomfort and pain and 20% reported limitations regarding usual activities. In addition, the results demonstrated an inverse correlation between health and psychological distress, highlighting the significant relation between mental health and physical health among caregivers of MS. Because perceived health of the caregiver affects the caregiver's ability to continue to provide support to the patient (McKeown et al., 2003), research on the needs and burdens of caregivers is critical both to the caregivers and to individuals with MS.

Caregiver Mental Health

Beyond physical health impacts of caregiving, multiple studies have shown the deleterious effects that caregiving for a patient with MS can have on the mental health of the caregiver (Knight, Devereux, & Godfrey, 1997; McKeown et al., 2003; Pakenham, 2001; Rivera-Navarro, Morales-González, & Benito-Leon, 2003). Knight et al. (1997) conducted one of the first studies to examine a sample of spousal caregivers of MS. One question these caregivers were asked was whether the caregivers felt depressed. Approximately 50% of the sample indicated that they feel depressed "never or rarely," 31% responded with "sometimes," and the remaining 20% of the sample selected "quite often."

In the study by Argyriou and colleagues (2011) that examined quality of life and emotional burden among caregivers of MS in Greece, mental health and physical health variables were assessed. Among the 35 caregivers in the study, 22 were diagnosed with anxiety (5 mild and 17 moderate), while 12 were diagnosed with depression (4 mild and 8 moderate). Furthermore, the socio-demographic variables that were examined in this study (e.g., gender, employment, relation to patient) were surprisingly not correlated with psychological outcomes,

except for education status, such that the more education a caregiver had, the worse the psychological outcomes they endorsed.

Pakenham (2005) looked at caregivers of MS to examine coping styles, positive affect, life satisfaction, benefit finding, anxiety, and depression. One finding that emerged was a difference between the mental health of those caring for an individual with a disease that has a chronic progressive course compared with someone with a relapse-remitting course. They found that caregivers of patients with a chronic progressive course reported significantly higher levels of distress than caregivers of patients with a relapse-remitting course (Pakenham, 2005). This is in line with other research that suggests that the severity of the illness is related to the amount of burden experienced by the caregiver (Khan et al., 2007). Lazarus and Folkman (1984) have previously examined stress and coping as it relates to caregiving in the Transactional Model of Stress and Coping. They suggested that stress occurs when the demands outweigh the resources the individual has access to in a given situation. While they highlight uncontrollability as one variable that is related to stress and coping, the level of the patient's disability is also an important factor that affects caregiver adjustment. One study that looked at caregivers of individuals with MS with various levels of illness found that the patient's disability was related to caregiver mood and caregiver burden, but not related to health, family, and life satisfaction (O'Brien, Wineman, & Nealon, 1995). Thus, it is plausible that the severity of illness affects stress and coping in caregivers above and beyond the controllability of the situation.

Coping with the challenges associated with caregiving for an individual with MS is also related to patient symptoms and patient mental health. As patient satisfaction with life increases, caregiver adjustment increases concurrently (Pakenham, 2005). In addition, as the patient's health-related quality of life increases, caregiver burden also improves (Rivera-Navarro et al.,

2003). Similarly, caregivers of MS report experiencing more strain when patients' quality of life scores are lower (Khan et al., 2007). Buchanan and Huang (2011) identified several factors associated with poorer mental health, including worse overall health of the patient with MS, those caregivers who endorsed experiencing more burden or feeling "emotionally drained," and whether the caregiver indicated a need for mental health services within the previous year. Given the abundance of research concerning the mental health of caregivers, particularly those caring for an individual with MS, it is important to identify ways in which mental health can be improved.

Caregiver Burden

Burden is a construct that has been defined in somewhat vague terms in previous psychological research. In the 1960's, researchers defined burden based on two discrete constructs: objective and subjective burden of care. Objective burden was previously defined as the impact that caregiving has on the household (e.g., financial pressures), while subjective burden was defined as the extent to which caregivers perceive the level of burden (Hoenig & Hamilton, 1966). More recently, it has been defined as "a psychological state that ensues from the combination of the physical work, emotional and social pressure, like the economic restrictions that arise of taking care of the patients" (Dillehay & Sandys, 1990, p. 263). Moreover, Buhse (2008) describes it as a "multidimensional response to physical, psychological, emotional, social, and financial stressors associated with the caregiving experience" (p. 27). Burden is commonly experienced by caregivers because of the demands and expectations that are placed on them when they take on the role of caregiver. Among informal caregivers of individuals with MS, more than 20% reported that caregiving was burdensome most or all of the time (Buchanan, Radin, Chakravorty, & Tyry, 2009). Muscle paralysis or weakness, difficulty

walking, and loss of sensation in patients with MS have been found to be some of the most distressing physical symptoms for caregivers to manage (Knight et al., 1997). Other symptoms that are commonly reported as distressing to caregivers of MS include motor problems and gait disturbance, sudden mood changes, incontinence, and pain (Knight et al., 1997).

Several studies have explored the role of caregiving specific to MS in order to identify variables that are significantly predictive of caregiver burden. Caregivers of individuals with neurodegenerative diseases, including MS, demonstrate increased burden as their quality of life decreases (Rivera-Navarro et al., 2003). Data also suggest that gender may play a role in perceived burden, with women experiencing more burden in caregiving roles than men, which may be due to differences in coping styles. Multiple studies have examined these patterns and suggest that men tend to employ planning-based strategies, whereas women often express a need for space or distance from their spouses with MS (Gulick, 1995; DeRosier, Catanzaro, & Piller, 1992; Pakenham, 2001). Knight et al. (1997) reported that other factors related to burden include worry and pessimism about the future, time burden, financial worries, and tiredness. Rivera-Navarro et al. (2003) identified two other predictors of burden: the amount of time a caregiver spends caring for a relative with MS and an inverse relationship between burden and the patient's health-related quality of life. Caregivers of MS also tend to report experiencing more burden when the patients they are caring for have problems with memory and daily activities, and when their personalities change. Having to alter personal plans or finances have also been related to burden (Chipchase & Lincoln, 2001). Due to these circumstances, caregivers of MS often report feeling overwhelmed, ignored, and neglected (Courts et al., 2005).

Caregiver Strain

Strain is defined as “[the] additional demands and their impact on the family” (Brannan, Athay, & Vides de Andrade, 2012, p. 51). Strain is another mental health variable that has been examined in the context of caregivers of MS (Chipchase & Lincoln, 2001; Khan et al., 2007). In a 2001 study, Chipchase and Lincoln found that 46% of caregivers reported experiencing strain. The caregivers who were surveyed indicated that the three most commonly experienced strains included: the person with MS had changed from his or her former self, the need to make changes in personal plans, and the experience of financial strain. If the patients with MS had memory problems or needed consistent help with daily life activities, the caregivers also reported increased levels of strain.

In another study examining patients with MS, 42% of caregivers reported experiencing strain due to emotional adjustment, other demands on the caregiver’s time, change in the caregiver’s personal plan, and disrupted sleep. The two variables that were most commonly endorsed as causing “severe” strain were emotional adjustment and family adjustments due to disrupted routine. In terms of patient characteristics, caregivers were more likely to endorse higher levels of burden and strain if the individuals they were caring for demonstrated higher levels of depression, anxiety, and stress (Khan et al., 2007).

Social Support in the Context of Caregiving

Social support and/or isolation are also important when considering the high levels of burden and strain among other mental health issues that accompany caregiving. Because of the increasing demands and obligations faced by caregivers, it is not surprising that they typically have less time to participate in activities that they enjoy (Akkuş, 2011). Research completed in the United States shows that caregivers of MS receive significantly less social support than non-caregivers (Good, Bower, & Einsporn, 1995; Weinert & Long, 1993), and an additional study

conducted in Brazil demonstrated that men are four times more likely than women to report social isolation (Neri, Yassuda, Fortes-Burgos, Mantovani, Arbex et al., 2012). Moreover, a Turkish study found that those who felt socially isolated were significantly more likely to experience burnout related to caregiving (Akkuş, 2011). General caregiver research suggests that a lack of social support is related to a greater amount of burden perceived by the caregiver and that the number of social visits received by the caregiver has been significantly inversely linked to the amount of burden a caregiver experiences (Zarit, Reever, & Bach-Peterson, 1980). Zarit et al. (1980) assessed the amount of burden perceived by caregivers of patients with dementia in the United States and found that the more social visits a caregiver receives, the lower the amount of burden they report. Based on the previous research on social support among caregivers, particularly those caring for someone with MS, it is evident that this factor has the potential to significantly improve or negatively impact the caregivers' experiences.

Latino Caregivers

The cultural context of caregiving is critical in understanding how it may play a part in caregiver expectations, roles, and health, especially given what we know about caregivers of MS – that they are most often a spouse or another member of the family (Akkuş, 2011). One term that is frequently studied in the context of Latino families with a chronically ill relative is the idea of “familism,” which suggests that it is culturally valued for individuals to be loyal and supportive, and to express solidarity toward a member of the family, both immediate and extended, who is diagnosed with an illness or injury (Delgado & Tennstedt, 1997; Nápoles et al., 2010). Similarly, Latino culture typically includes a sense of collectivism, compared to other cultures, which likely ties into the obligations faced by caregivers in these families (Triandis, 1995). Shurgot and Knight (2004) examined caregivers of patients with dementia within a Latino

population. They found that familism was positively associated with a Latino orientation, while it was negatively associated with an Anglo orientation. There was also a negative relationship between familism and perceived burden, such that those who endorsed familism were more likely to experience lower levels of perceived burden. In addition, they found a positive relationship between perceived burden and depression (Shurgot & Knight, 2004).

Parveen and Morrison (2009) conducted a pilot study examining predictors of familism among a sample of British South-Asian and White-British caregivers. The findings suggested that specific demographic variables, including age, gender, ethnicity, and coping may be indicative of familism. Particularly, caregivers in the following categories endorsed the highest levels of familism: caregivers between 18 and 43 years of age; females, though the researchers explained that this needs to be explored further due to the sample size; individuals who identified as South-Asian compared to White; and those who utilized more coping strategies, particularly religious-based ones and instrumental support.

While familism is typically valued among Latinos, some other research suggests that the amount of support received by the primary caregivers is actually not as great as would be expected based on the strong familial ties. Cox and Monk (1993) surveyed Latino caregivers of individuals with Alzheimer's disease and found that approximately 60% of the sample reported that they did not have another person who could provide the care to the patient if they were unable to carry out their caregiving role. This could relate to an increase in perceived burden. They also found that nearly 54% of the sample indicated that they had people to talk to about their problems (Cox & Monk, 1993). As was discussed previously, social support appears to be a critical component of caregiving, and one that might serve as a protective factor in these families.

Another related construct is known as “role engulfment,” which suggests that caregivers tend to lose their sense of self and identity because they fully immerse themselves in their role as a caregiver (Dilworth-Anderson, Williams, & Gibson, 2002; Skaff & Pearlin, 1992). Dilworth-Anderson et al. (2002) posited that role engulfment is more prevalent in Latino families than in White and African American families because of their perceived obligations surrounding caring for and supporting the ill family members.

Additional studies have assessed the mental health of Latino caregivers and show that when compared to other racial and ethnic groups, Latinos report higher rates of depression and personal role-strain (Covinsky, Newcomer, Fox, Wood, Sands, Dane et al., 2003), and recent data exhibit trends suggesting lower levels of overall functioning (Perrin, Heesacker, Uthe, & Rittman, 2010). Magaña, García, Hernández, and Cortez (2007) examined the role of caregiving among a sample of Latino caregivers of patients with schizophrenia. The participants were family members who were recruited from three mid-size cities in the United States. The researchers found that perceived burden mediated the relationship between the patients’ psychiatric symptoms and the caregivers’ level of depression. In addition, the amount of stigma related to the psychiatric disorder perceived by the caregiver was significantly related to caregiver depression.

Other research has examined specific factors that relate to caregiver mental health. In particular, one study surveyed Latina and Caucasian female caregivers of Alzheimer’s in the United States and found that Latina caregivers reported their caregiving role as a positive experience, significantly more so than Caucasian caregivers. They found that Latina caregivers also pray significantly more than Caucasian caregivers, attend religious services more frequently, and endorse religion as more important (Coon, Rubert, Solano, Mausbach, Kraemer, Arguëlles et

al., 2004). This study may have important implications for the protective role that religion and spirituality may play in positive and negative outcomes related to caregiving.

Though previous research on caregivers of patients with MS is limited, particularly in Latino populations, extant research that has examined the role of Latino caregivers of individuals with other illnesses provide valuable insight into the cultural influences that may be impacting the physical and mental health of the caregivers in the present study. It is important to note that the present study is one of the first studies to specifically examine the effects of being a primary caregiver for an individual with MS within a Mexican sample.

Present Study

The Biopsychosocial Model. The Biopsychosocial Model provides an overarching framework from which we can understand health and illness, while incorporating relevant biological, psychological, and social contexts (Engel, 1977). Engel (1977) wrote, “The boundaries between health and disease, between well and sick, are far from clear and never will be clear, for they are diffused by cultural, social, and psychological considerations” (p. 196). For the purpose of this study, the physical health of the caregiver will be understood as the biological factor, while the mental health of the caregiver will be understood as the psychological factor, and the Latino cultural context of these caregivers will represent the social factor in this model.

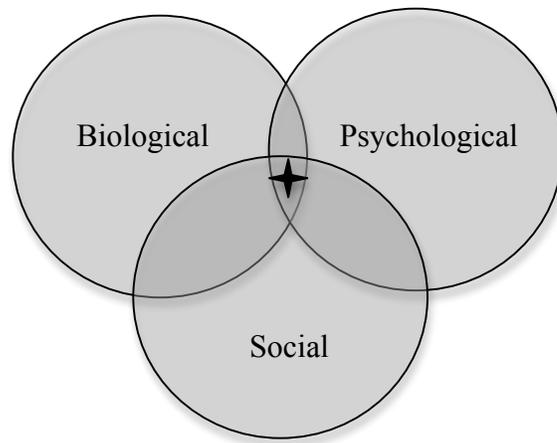


Figure 2. This model provides a visual representation of the Biopsychosocial Model. Adapted from “The need for a new medical model: A challenge for biomedicine,” by G. L. Engel, 1977, *Science*, 196, p. 133.

The Biopsychosocial Model allows us to recognize an individual’s subjective experience, in this case, as a caregiver of a patient with MS (Borrell-Carrió, Suchman, & Epstein, 2004). Engel (1977) posited that the way to understand and conceptualize illness is dependent on the inclusion of these three aspects. This perspective further added to the field of medicine by suggesting that clinicians examine each aspect of an individual. By doing so, we can optimally apply treatment and organize health care that is appropriate given the scope of the individual’s subjective experience (Engel, 1977). Understanding how these constructs interact with each other is crucial in caregiver research, particularly because studies show that the health of the caregiver directly affects the health of the patient (McKeown et al., 2003).

Specific Aims

The purpose of the present study is to examine the relation between mental health and physical health among a sample of caregivers of MS in Mexico. In addition, two variables, burden and social support, are examined as potential moderators. For the purpose of this study, physical health is measured using four of the eight scales within the Short Form Health Status

Survey (SF-36; bodily pain, general health, performance in physical role, and physical functioning). Each of the mental health variables (anxiety, depression, satisfaction with life, and self-esteem) are assessed using four discrete measures.

Aim 1. To assess the overall relation between two sets of variables, mental health and physical health. Previous research has examined the detrimental effects that caregiving can have on the mental health and physical health of caregivers of MS (Knight et al., 1997; McKeown et al., 2003; Pakenham, 2001; Rivera-Navarro et al., 2003), which provides justification for this specific aim. It is further hypothesized that there will be a significant overall association between mental health and physical health in the present study.

Aim 2. To determine whether physical health is significantly related to mental health status among this sample, and to identify factors that are uniquely associated with the mental health in these models. Four distinct analyses are conducted to understand how well demographic and physical health variables contribute to the variability in anxiety, depression, satisfaction with life, and self-esteem. This aim builds on previous research on the relation between mental health and physical health. It is hypothesized that physical health will be significantly related to anxiety, depression, satisfaction with life, and self-esteem after controlling for demographic variables. Specifically, an inverse relation is expected between physical health and anxiety and depression, such that as physical health increases, anxiety and depression will decrease. Furthermore, it is hypothesized that there will be a positive association between physical health and satisfaction with life and self-esteem, such that as physical health increases, satisfaction with life and self-esteem will increase as well.

Aim 3. To examine whether burden and social support affect the strength of (i.e., moderate) the relation between mental health and physical health when controlling for demographic variables.

Sub-Aim 3a. To determine whether burden affects the strength of the relation between mental health and physical health. Previous research has examined various aspects of caregiver health along with caregiver burden and has found positive relations between these two variables (Buchanan et al., 2009; Knight et al., 1997). Given these findings, it is plausible that perceived burden plays a similar role in moderating the relation between mental health and physical health within the context of the present study. Specifically, it is hypothesized that burden will increase the influence of mental health on physical health. Additionally, it is hypothesized that burden will increase the influence of physical health on mental health.

Sub-Aim 3b. To examine the role that caregiver social support plays in influencing the strength of the relation between mental health and physical health. Based on previous research that has documented positive relations between caregiver social support and health (Good et al., 1995; Weinert & Long, 1993), it is hypothesized that social support will moderate this relation and decrease the influence of mental health on physical health. Moreover, it is hypothesized that social support will decrease the influence of physical health on mental health.

Method

Participants

Eighty-six caregivers of patients with MS were recruited from the Mexican Foundation for Multiple Sclerosis and the Department of Neurosciences of the University Center for Health

Sciences, University of Guadalajara, Mexico. Medical records were accessed and reviewed at these locations. The retrospective sample available for study online included relapse-remitting, primary progressive, and secondary progressive sub-types of MS. Participants were eligible to participate in the study if they had cared for individuals with MS for at least six months.

Caregivers were excluded from the study if they reported a neurological disorder other than MS, a psychiatric disorder, or a learning disability. Caregivers who met the inclusion criteria were then contacted by phone. Two master's-level psychologists were responsible for recruiting and consenting the participants. Five of the caregivers who were contacted refused to participate in the study.

The majority of caregivers in this study were female (66.7%) with an average age of 43.37 years ($SD = 15.32$). Most of the patients in this study were also female (69.1%) with an average age of 33.26 years ($SD = 10.78$). Many of the caregivers in this study (45.7%) were parents of the patients with MS, while 28.4% were spouses, 12.3% were siblings, 3.7% were boyfriends/girlfriends, 1.2% were friends, 1.2% were professional caregivers, and 1.2% were "other" caregivers. The average length of time spent caregiving was 52.31 months ($SD = 59.29$), while the mean amount of time spent caregiving per week was 69.01 hours ($SD = 55.90$). The average age of diagnosis for the patient with MS was 28.17 years ($SD = 10.17$), and the average age of symptom onset was 26.30 years ($SD = 9.76$). Patients were categorized into three groups depending on the self-reported type of MS. Most of the patients had relapse-remitting MS (79.0%), 1.2% had primary progressive MS, and 19.8% had secondary progressive MS. Demographic information for participants in this study, including both caregivers and patients, is also summarized in Table 1 and Table 2, respectively.

Table 1

Demographic characteristics of MS caregivers (n = 81)

Variable	Value
Age, mean (SD), y	43.37 (15.32)
Gender, No. (%)	
Male	27 (33.3)
Female	54 (66.7)
Education, mean (SD), y	11.74 (4.42)
Marital status, No. (%)	
Single	19 (23.5)
Married	53 (65.4)
Separated	2 (2.5)
Divorced	1 (1.2)
Widow/er	4 (4.9)
Civil Union	2 (2.5)
Relationship to the patient, No. (%)	
Parent	37 (45.7)
Spouse	23 (28.4)
Sibling	10 (12.3)
Child	5 (6.2)
Boyfriend/Girlfriend	3 (3.7)
Friend	1 (1.2)
Professional Caregiver	1 (1.2)
Other Caregiver	1 (1.2)
Employment, No. (%)	
Employed, Full-time	21 (25.9)
Employed, Part-time	16 (19.8)
Hourly Worker	3 (3.7)
Homemaker	25 (30.9)
Student, Full-time	3 (3.7)
Student, Part-time	4 (4.9)
Unemployed	4 (4.9)
Retired	3 (3.7)
Other	2 (2.5)
Duration of caregiving, mean (SD), mo	52.31 (59.29)
Hours per week caregiving, mean (SD)	69.01 (55.90)

Table 2

Demographic characteristics of the patients with MS for whom caregivers were providing care (n = 81)

Variable	Value
Age, mean (SD), y	33.26 (10.78)
Gender, No. (%)	
Male	25 (30.9)
Female	56 (69.1)
Education, mean (SD), y	13.35 (3.97)
Age at diagnosis, mean (SD), y	28.17 (10.17)
Age at symptom onset, mean (SD), y	26.30 (9.76)
Employment, No. (%)	
Employed, Full-time	22 (27.2)
Employed, Part-time	7 (8.6)
Hourly worker	8 (9.9)
Homemaker	19 (23.5)
Student, Full-time	9 (11.1)
Student, Part-time	2 (2.5)
Unemployed	6 (7.4)
Disability compensation	7 (8.6)
Other	1 (1.2)
Type of MS, No. (%)	
Primary progressive	1 (1.2)
Secondary progressive	16 (19.8)
Relapse-remitting	64 (79.0)
Socioeconomic status of the household, No. (%)	
Less than minimum wage	1 (1.2%)
Minimum wage	6 (7.4%)
1-2 times minimum wage	11 (13.6%)
2-3 times minimum wage	10 (12.3%)
3-4 times minimum wage	7 (8.6%)
4-5 times minimum wage	11 (13.6%)
More than 5 times minimum wage	35 (43.2%)

Measures

Information from caregivers of patients with MS was collected through a series of previously validated and researcher-constructed measures. Demographic information, physical health status, and mental health outcomes information were translated into Spanish. Spanish-language versions of the other assessments were utilized.

Demographic Variables. The caregivers responded to several demographic questions (e.g., age, gender, marital status, years of education, relationship to the patient, employment status, duration of caregiving, hours per week providing care). Demographic information was also collected for the patient (e.g., age, gender, number of years since diagnosis, type of MS, socioeconomic status), reported by the caregiver. Two participants reported more than 168 hours per week providing care. Those values were changed to the maximum number of hours in a week (168).

Short Form Health Status Survey (SF-36). The SF-36 is a 36-item measure that evaluates general health using eight scales (physical functioning, performance in physical role, performance in emotional role, vitality, social functioning, bodily pain, general health perceptions, and mental health; Ware & Sherbourne, 1992). It has been used in many studies examining specific illnesses, as well as in research that targets general health conditions, and demonstrates strong psychometric properties. Responses are rated on five- or six-point scales, and some items need to be recoded. Scores from all of the items (after recoding) are summed and create a total score ranging from 0 to 100. Two summary scores, the Mental Health Component Score (MCS) and the Physical Health Component Score (PCS) have been developed (Ware, Kosinski, & Keller, 1994; McHorney, Ware, & Raczek, 1993). A sample item includes, “How

much bodily pain have you had during the past four weeks?” For the purpose of the present study, the PCS was used to examine physical health by means of its four subscales (physical functioning, performance in physical role, bodily pain, and general health perceptions). This measure has been used previously in studies examining the health of caregivers of patients with MS, specifically one that recruited participants from a Turkish population (Akkuş, 2011). Additionally, the Spanish version of this measure has shown to be reliable and valid (Alonso, Prieto, & Anto, 1995). Internal consistency for the SF-36 in this sample was excellent (Cronbach’s alpha = .94).

Satisfaction with Life Scale (SWLS). The SWLS is a self-report measure that assesses global life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985). It is a 5-item, cumulative scale that instructs participants to rate each item on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). Higher scores on this measure represent greater life satisfaction (Pavot & Diener, 1993). The Spanish-language version has demonstrated strong psychometric properties (Pons, Atienza, Balaguer, & García-Merita, 2000). Internal consistency for the SWLS in this sample was good (Cronbach’s alpha = .81).

State-Trait Anxiety Inventory (STAI). The STAI is a 40-item self-report measure of anxiety that measures both state and trait experiences of anxiety (Spielberger, 1983). The S-Anxiety scale assesses the “intensity of anxiety as an emotional state,” which focuses on the “right now,” and requires participants to rate each item on a 4-point Likert scale (0 = not at all to 3 = very much so; Spielberger, 2010; Spielberger, 1983). The T-Anxiety scale assesses unique differences that may make some individuals more prone to personality types that are typically more anxious, and asks participants to rate their responses on the same 4-point Likert scale. The scores on each of the scales are added together to create one overall score ranging from 0 to 60,

with higher scores demonstrating higher anxiety. The Spanish version of the measure (Spielberger & Díaz-Guerrero, 1975) has also demonstrated strong psychometric properties (Novy, Nelson, Smith, Rogers, & Rowzee, 1995). Internal consistency for the STAI in this sample was acceptable (Cronbach's alpha = .73). For the purpose of this study, the overall score was combined given the correlation between the state and trait scales, $r = .76$.

Rosenberg Self-Esteem Scale (RSES). The RSES is a 10-item questionnaire that asks respondents to rate their overall sense of worth on a 4-point Likert scale (1 = strongly disagree to 4 = strongly agree; Rosenberg, 1965; Schmitt & Allik, 2005). Overall scores range from 10 to 40, with higher scores indicating higher self-esteem, while scores less than 25 indicate clinically significant low self-esteem (Anson & Ponsford, 2006). This measure has demonstrated adequate reliability and validity (Gray-Little, Williams, & Hancock, 1997). The RSES has also been translated in several languages, and has demonstrated good psychometric properties in 53 countries, including Latin American countries such as Argentina, Bolivia, Brazil, Chile, Mexico, and Peru (Schmitt & Allik, 2005). Internal consistency for the RSES in this sample was good (Cronbach's alpha = .86).

Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 consists of nine items and was used to assess caregiver depression. Respondents are asked to rate, on a 4-point Likert scale (0 = not at all to 3 = nearly every day), how often specific items have bothered them. The responses for each item are totaled and range between 0 and 27, with higher scores indicating greater experiences of depression (Kroenke, Spitzer, & Williams, 2001). Overall scores can fall in a variety of ranges: 0-4 (no depression), 5-9 (mild depression), 10-14 (moderate depression), 15-19 (moderately severe depression), and 20-27 (severe depression). This measure has also been used

in Spanish-speaking populations (Diez-Quevedo, Rangil, Sanchez-Planell, Kroenke, & Spitzer, 2001). Internal consistency for the PHQ-9 in this sample was good (Cronbach's alpha = .88).

Zarit Burden Interview (ZBI). The ZBI is a 22-item self-report questionnaire used to assess burden among caregivers (Zarit et al., 1980). Respondents are asked to respond to each item on a scale ranging from 'never' to 'nearly always.' Individual item scores are totaled to produce an overall score, which ranges from 0 to 88. Higher scores on this measure indicate greater levels of distress. Categories have been developed for the following scores: 0-20 (little or no burden), 21-40 (mild to moderate burden), 41-60 (moderate to severe burden), and 60-99 (severe levels of burden; Karlikaya, Yukse, Varlibas, & Tireli, 2005). The Spanish version of this questionnaire has demonstrated good internal reliability in previous studies (Marín, 1996). Internal consistency for the ZBI in this sample was excellent (Cronbach's alpha = .90).

Interpersonal Support Evaluation List Short Version (ISEL-12). The ISEL-12 is a 12-item self-report measure that evaluates available social support (Cohen, Mermelstein, Kamarck, & Hoberman, 1985). The scale is broken up into three subscales: tangible (perceived availability of material aid), appraisal (perceived availability of people to talk to and people to get advice from), and belonging (perceived ability of people to do things with). Each of the subscales include four items and are measured on a 4-point Likert scale from "definitely false" to "definitely true." For the purpose of this study, the total ISEL-12 score was used to evaluate social support. This instrument has been used previously in populations with studies assessing individuals with various health-related concerns and illnesses and has demonstrated adequate reliability and validity (Cohen et al., 1985). The Spanish version of this measure has also been used in similar studies (Arango-Lasprilla, Plaza, Drew, Romero, Pizarro, Francis et al., 2010). Internal consistency for the ISEL in this sample was good (Cronbach's alpha = .85).

Procedure

Prior to beginning the study, the protocol was reviewed and accepted by the Mexican Foundation for Multiple Sclerosis. Recruitment occurred at the Mexican Foundation for Multiple Sclerosis and the Department of Neurosciences of the University Center for Health Sciences, University of Guadalajara in Guadalajara, Mexico. Consent forms were completed by caregivers before the study began and collected by the psychologist on staff. Most of the assessments were administered verbally by master's-level psychologists while they were supervised by a university teaching staff member. Study staff members who did not administer the surveys verbally followed up with every participant who left a blank answer on his or her assessments in order to gather complete data from every patient and caregiver.

Analyses

Power Analysis. A power analysis was conducted using G*Power 3 software to determine the effect size that 81 participants would be able to uncover in the present study. The analysis was conducted for a linear multiple regression: fixed model, R^2 deviation from zero with three predictors. The analysis demonstrated that 54 participants would be needed to detect a large effect and some medium effects. Given the results of this analysis, a sample size of 81 was determined to be sufficient for the present study.

Canonical Correlation. A canonical correlation was computed to understand the relations between two sets of predictor and criterion variables (mental health and physical health, respectively). The purpose of a canonical correlation is to extract shared variance from two sets of variables to produce a correlation coefficient (r) that reflects common variance between the two sets of independent and dependent variables. A canonical correlation is computed based on two canonical variates of shared variance (one variable from each set), which differs from the

Pearson r . This analysis produces the number of canonical correlations equal to the number of variables in the smallest variable set. In this analysis, both sets include four variables, which means that each canonical correlation analysis will produce four canonical correlations. Each canonical correlation is comprised of variance unique from that in the other canonical correlations. The first canonical correlation is the largest, while each additional canonical correlation decreases as shared variance is extracted from the model, unless the initial canonical correlation yields 1.00, though that is uncommon.

Correlation Matrix. A correlation matrix was computed to determine relations between all of the mental health and physical health variables included in the present study. A second correlation matrix was conducted as an exploratory analysis to determine significant correlations between demographic variables and general health.

Moderation Analysis. Four moderation analyses were conducted through a series of hierarchical regressions. Based on the findings from the canonical correlation, moderation analyses proceeded with the variables found to explain the most variance first.

Hierarchical Multiple Regression. Four hierarchical multiple regressions were conducted to determine whether demographic and physical health variables are significantly related to anxiety, depression, satisfaction with life, and self-esteem. In addition, these analyses can detect unique variance that is added to the model by each variable in each additional step of the model. In the first step, demographic variables were entered to determine the unique influence that they have on the criterion variable. By entering the demographic variables first, they were subsequently controlled for in the second step. In the second step, demographic and physical health variables were entered into the model to determine if they increased the amount

of variance accounted for in the relation to the four mental health outcomes above and beyond demographic variables in the first step.

Results

Overview of Specific Aims

The present study examined a variety of relations between mental health and physical health variables to determine relevant connections between these two constructs. The first specific aim hypothesized that there would be an overall, significant relation between the mental health and physical health variables. The second specific aim hypothesized that there would be significant relations between demographic and physical health variables, and mental health variables. The third specific aim hypothesized that burden and social support would significantly moderate the relations between mental health and physical health (in both directions). The implications for the findings identified in the present study are discussed in greater depth below.

Correlation Matrix

The first correlation matrix included all mental health (anxiety, depression, satisfaction with life, self-esteem) and physical health (bodily pain, general health, performance in physical role, physical functioning) variables, as well as burden and social support, as shown in Table 3. Results demonstrated significant relations between all of these variables, except for the following two sets of variables: self-esteem and performance in physical role and satisfaction with life and social support.

Table 3

Correlations between caregiver mental health and physical health variables

Variables	1	2	3	4	5	6	7	8	9	10
1. General Health	1.00									
2. Bodily Pain	.61**	1.00								
3. Physical Functioning	.62**	.61**	1.00							
4. Performance in Physical Role	.46**	.22*	.29**	1.00						
5. Anxiety	-.50**	-.47**	-.34**	-.33**	1.00					
6. Self-Esteem	.49**	.34**	.26*	.17	-.54**	1.00				
7. Social Support	.49**	.36**	.37**	.26*	-.42**	.50**	1.00			
8. Satisfaction with Life	.30**	.28*	.25*	.28*	-.46**	.34**	.17	1.00		
9. Depression	-.68**	-.55**	-.49**	-.42**	.59**	-.49**	-.45**	-.37**	1.00	
10. Burden	-.50**	-.38**	-.38**	-.52**	.55**	-.39**	-.38**	-.47**	.56**	1.00

* $p < .05$ ** $p < .01$

The second correlation matrix was exploratory in nature and included general health and several demographic variables (age, years of school, gender, hours per week of caregiving, duration of caregiving, and socioeconomic status), as seen in Table 4. General health was significantly correlated with age, years of school, gender, hours per week of caregiving, and duration of caregiving. Specifically, better general health was associated with younger age, more years of school, female gender, fewer hours per week of caregiving, and a shorter duration of caregiving. It was not significantly related to socioeconomic status.

Table 4

Correlations between caregiver general health and demographic variables

Variables	1	2	3	4	5	6	7
1. General Health	1.00						
2. Age	-.35**	1.00					
3. Years of School	.31**	-.24*	1.00				
4. Gender	-.46**	.27*	-.27*	1.00			
5. Hours/Week Caregiving	-.33**	.33**	-.40**	.26*	1.00		
6. Duration of Caregiving	-.45**	.42**	-.18	.34**	.29**	1.00	
7. Socioeconomic Status	.07	.17	.35**	-.20	-.24*	-.00	1.00

* $p < .05$

** $p < .01$

Canonical Correlation

Figure 3 illustrates the conceptual basis for and the results of the first canonical correlation from this analysis. In this figure, the canonical variates of shared variance within a single variable set (shown in circles) are derivations of the two sets of variables (shown in boxes). Based on this analysis, depression and general health were identified as the predictor and criterion variables to use in the moderation analyses.

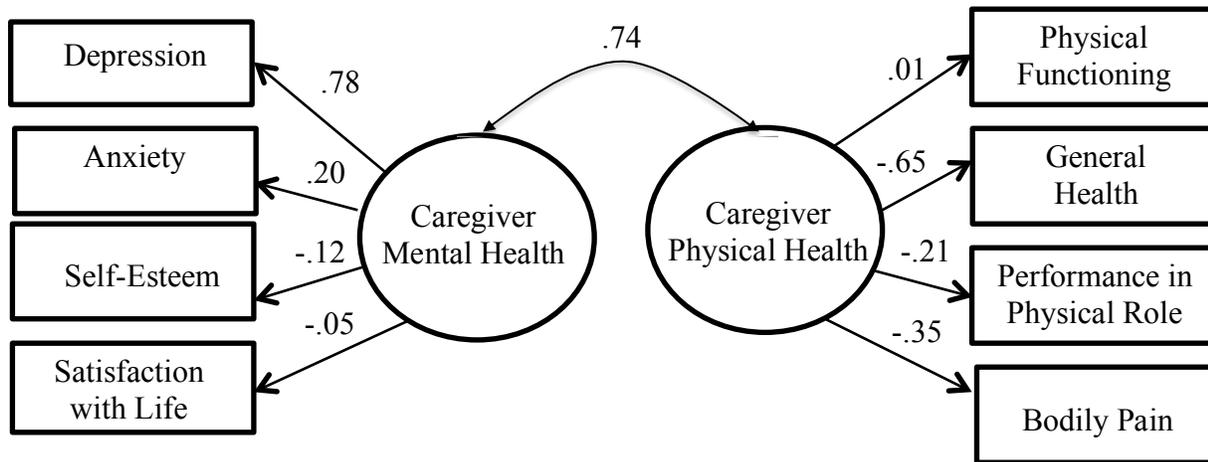


Figure 3. Conceptual model for the canonical correlation between mental health and physical health variables.

A canonical correlation was computed to determine which specific aspects of caregiver mental health are most linked to which specific aspects of their physical health. The findings from this analysis support the hypothesis provided in the first specific aim, positing that there would be a significant relation between mental health and physical health. Satisfaction with life, anxiety, depression, and self-esteem were entered as mental health variables and performance in physical role, general health, physical functioning, and pain were entered as physical health variables. The first canonical correlation was .74 (52.7% overlapping variance), $\lambda = .41$, $\chi^2(16) = 67.37$, $p < .001$. Based on Cohen's (1988) standards, this correlation falls within the large range of effects. Standardized canonical coefficients were calculated to compare the contributions of the variables to each of the canonical correlations. In the first canonical correlation, the standardized canonical coefficients for the caregiver mental health variables showed that depression loaded most highly (.776), followed by anxiety (.200), then by self-esteem (-.122), and lastly by satisfaction with life (-.047). Because the depression coefficient was above the .40 cut off, depression was determined to be the main focus of interpretation for caregiver mental health. For the physical health variables, general health loaded most highly (-.648), followed by

pain (-.347), then by performance in physical role (-.213), and lastly by physical functioning (.013). Similar to the mental health coefficients, only one variable, general health, fell above the .40 cut off, suggesting that general health should be the focus of interpretation for caregiver physical health. This pattern of shared variance suggests that caregivers of patients with MS experienced more depression when they reported worse general health. In addition, the fact that only one variable from each set came out above the threshold is noteworthy.

Moderation Analysis

Based on the findings from the canonical correlation, depression was entered as the predictor variable and general health was entered as the criterion variable for the first two moderations. In the second moderation analysis, social support was entered with depression in the first step, and the interaction between social support and depression was entered in the second step. Including the interaction in the final step determines how much more variance can be explained, and whether the addition of the interaction term is significant. The third and fourth moderation analyses were conducted based on research that has demonstrated a bidirectional relation between mental health and physical health, such that mental health affects physical health and physical health affects mental health. For example, one study examined the rates of depression among patients with neurological diseases and found lifetime prevalence rates as follows: Parkinson's (40-50%), Huntington's (approximately 40%), MS (10-50%), and Alzheimer's (15-55%; Popkin & Tucker, 1994). Conversely, Rugulies (2002) conducted a review and meta-analysis on depression and coronary artery disease. The findings demonstrated that patients who are depressed are nearly two-times more likely to suffer from a heart attack than healthy controls in the general population. Given the bidirectional nature of the relation between mental health and physical health, these moderations were conducted in both directions.

The third and fourth moderation analyses were similar to the first two, except general health was entered as the predictor variable and depression was entered as the criterion variable. Similarly, burden and social support were entered alongside the predictor variable in the first step and the interaction between the moderator and the predictor variable was entered in the second step. Like the first set of moderations, including the interaction term in the final step in the model demonstrates how much more variance can be explained, and whether the addition of the interaction term is significant. Surprisingly, none of the results from the moderation analyses supported the hypotheses presented in the third specific aim, including sub-aims 3a and 3b, which will be discussed in greater depth below.

Burden. In the first moderation analysis, depression and burden were entered separately in the first step to determine the relation between these variables. In the second step, the interaction between depression and burden was entered, which demonstrated whether the overall model predicted general health. Hierarchical regression analysis evaluated the influence of burden on the relation between depression and general health. The overall model was significant, $F(3, 77) = 24.06, p < .001$. Depression was negatively related to general health, $\beta = -.58, p < .001$. Burden was unrelated to general health, $\beta = -.17, p = .081$. Further, the association between depression and general health was not moderated by burden, $\beta = -.04, \Delta R^2 = .00, \Delta F = .03, p = .859$.

In the second moderation analysis, general health and burden were entered separately in the first step to determine the relation between these variables. In the second step, the interaction between general health and burden was entered, which demonstrated whether the overall model predicted depression. Hierarchical regression analysis assessed the influence of burden on the relation between general health and depression. The overall model was significant, $F(3, 77) =$

30.32, $p < .001$. General health was negatively related to depression, $\beta = -.54$, $p < .001$ and burden was positively related to depression, $\beta = .29$, $p = .002$. Burden did not significantly moderate the relation between general health and depression, $\beta = -.28$, $\Delta R^2 = .02$, $\Delta F = 2.70$, $p = .104$.

Social Support. In the third moderation analysis, depression and social support were entered separately in the first step to determine the relation between these variables. In the second step, the interaction between depression and social support was entered, which demonstrated whether the overall model predicted general health. This hierarchical regression analysis evaluated the influence of social support on the relation between depression and general health. The overall model was significant, $F(3, 77) = 26.56$, $p < .001$. Depression was negatively related to general health, $\beta = -.58$, $p < .001$. Social support was positively related to general health, $\beta = .23$, $p = .010$. Further, the association between depression and general health was not moderated by social support, $\beta = -.17$, $\Delta R^2 = .00$, $\Delta F = .28$, $p = .597$.

In the final moderation analysis, general health and social support were entered separately in the first step to determine the relation between these variables. In the second step, the interaction between general health and social support was entered, which demonstrated whether the overall model predicted depression. The final hierarchical regression analysis examined the influence of social support on the relation between general health and depression. The overall model was significant, $F(3, 77) = 25.61$, $p < .001$. General health was negatively related to depression, $\beta = -.61$, $p < .001$, while social support was unrelated to depression, $\beta = -.15$, $p = .115$. Social support did not significantly moderate the relation between general health and depression, $\beta = .87$, $\Delta R^2 = .02$, $\Delta F = 3.00$, $p = .087$.

Hierarchical Multiple Regression

Anxiety. A hierarchical multiple regression analysis was computed to investigate the association between demographic and physical health variables and four discrete mental health outcomes (anxiety, depression, satisfaction with life, and self-esteem). Age, gender, education level, hours per week spent caregiving, and total duration of caregiving were controlled for in the first step. When age, gender, education level, hours per week spent caregiving, and total duration of caregiving were entered into the first step, together they significantly related to anxiety, $F(5, 75) = 2.88, p = .020, R^2 = .16$. As indicated by R^2 , approximately 16% of the variance in anxiety could be explained by these five demographic variables. Gender was uniquely related to anxiety in this step, $\beta = .37, p = .002$. In the second step, the four physical health variables were entered into the model and significantly improved explanation of anxiety variance, $\Delta R^2 = .21, F(4, 71) = 4.62, p < .001$. In this step, general health was uniquely associated with anxiety, $\beta = -2.10, p = .039$. Together, demographic and physical health variables significantly explained 37% of the variance in anxiety, $p < .001, R^2 = .37$. These findings support the hypothesis presented in the second specific aim, which suggested a significant, negative relation between physical health and anxiety.

Depression. A second hierarchical multiple regression was conducted to assess how strongly demographic and physical health variables related to depression. The same demographic variables entered in the first hierarchical multiple regression were entered into the first step of this analysis. The demographic variables were significantly related to depression, $F(5, 75) = 3.62, p = .006, R^2 = .19$. As indicated by R^2 , approximately 19% of the variance in depression could be accounted for by these five demographic variables. Gender was uniquely related to depression in this step, $\beta = .29, p = .012$. In the second step, the four physical health variables were entered into the model and significantly improved the relation to depression, $\Delta R^2 = .34,$

$F(4, 71) = 9.02, p < .001$. In this step, general health was uniquely related to depression, $\beta = -.42, p = .002$. Demographic and physical health variables were significantly related to depression, $p < .001, R^2 = .53$, together accounting for nearly 53% of the variance in depression. Further more, the results from this analysis support the hypothesis presented in the second specific aim, which suggested a significant, negative relation between physical health and depression.

Satisfaction with Life. A third hierarchical multiple regression was conducted to assess whether demographic and physical health variables related to satisfaction with life. The same demographic variables entered in the first hierarchical multiple regression were entered into the first step of this analysis. The demographic variables were not significantly related to satisfaction with life, $F(5, 75) = .21, p = .956$. In the second step, the four physical health variables were entered into the model and were not significantly related to satisfaction with life, $F(4, 71) = 1.43, p = .194$. These findings from this analysis did not support the hypothesis presented in the second specific aim, which proposed a significant, positive relation between physical health and satisfaction with life.

Self-Esteem. A fourth hierarchical multiple regression was conducted to assess whether demographic and physical health variables were significantly related to self-esteem. The same demographic variables entered in the first hierarchical multiple regression were entered into the first step of this analysis. The demographic variables were significantly related to self-esteem, $F(5, 75) = 2.51, p = .037, R^2 = .14$. As indicated by R^2 , approximately 14% of the variance in self-esteem could be accounted for by these five demographic variables. Gender was uniquely related to depression in this step, $\beta = -.34, p = .005$. In the second step, the four physical health variables were entered into the model and significantly improved the relation to self-esteem, $\Delta R^2 = .16, F(4, 71) = 3.50, p = .001$. In this step, general health was significantly related to self-

esteem, $\beta = .54$, $p = .001$. Together, demographic and physical health variables were found to be significantly related to self-esteem, $p = .001$, $R^2 = .31$, accounting for nearly 31% of the variance in self-esteem. These findings support the hypothesis presented in the second specific aim, which suggested a significant, positive relation between physical health and self-esteem.

Discussion

The current study was designed to examine the relations between mental health and physical health among caregivers of patients with MS in Mexico. Several robust findings emerged that will be important to incorporate into future studies and interventions concerning caregivers of MS, particularly in Mexico and in other Latino populations. The Biopsychosocial Model (Engel, 1977) provides a conceptualization for overall health and well-being, and suggests that biological, psychological, and social factors are necessary to understand peoples' overall subjective experiences. In this case, the mental health and physical health of caregivers of individuals with MS in Mexico is the target population. The present study identified findings that further support the use of this model in conceptualizing the overall health of caregivers of MS. The discussion will identify these relevant findings and highlight connections to the Biopsychosocial Model that reinforce the importance of interventions that include all three components. In addition, strengths, limitations, and future directions for research will be examined.

Overview of Specific Aims and Findings

A series of data analyses yielded several significant findings. The canonical correlation analysis demonstrated a large, significant overall effect between mental health and physical health, which supported the hypothesis predicted in the first specific aim. When individual canonical coefficients were broken down and assessed, a strong pattern between depression and

general health was detected. Given this finding, depression and general health were used in all of the moderation analyses, as discussed in greater depth below. In line with the second specific aim, four hierarchical multiple regressions were computed to determine whether demographic and physical health variables were significantly related to anxiety, depression, satisfaction with life, and self-esteem. The analyses revealed that demographic and physical health variables were significantly related to anxiety, depression, and self-esteem, though they were not significantly related to satisfaction with life. These findings mostly supported the proposed hypothesis, though the insignificant findings with satisfaction with life contradict the anticipated results. The third specific aim explored the potential moderating roles of burden and social support in the relations between mental health and physical health. As mentioned previously, depression was entered as the predictor variable and general health was entered as the criterion variable in two of the moderation analyses. For two additional analyses, the direction was flipped, such that general health was entered as the predictor variable and depression was entered as the criterion variable. In line with prior work, because of the clear bi-directional nature of mental health and physical health, these variables were treated as both the predictor and criterion in testing the models (Popkin & Tucker, 1994; Rugulies, 2002). Results from these four moderation analyses demonstrated that burden and social support did not influence the strength of the relations between the mental health and physical health variables (depression and general health) in either direction. These findings challenged the hypotheses laid out under the third specific aim, which anticipated that burden and social support would significantly moderate these relations. Additionally, a series of correlations were conducted and the implications will be discussed more fully in the following section. The analyses conducted in the present study revealed important

findings that may provide direction for future studies and interventions for caregivers of MS, specifically ones that are relevant to Latino populations.

Mental Health and Physical Health

The canonical correlation analysis revealed a significantly large association between mental health and physical health, which supported the first hypothesis. This means that the two sets of variables were highly correlated in this particular sample, and suggests the need for future research and interventions that target mental health and physical health concurrently.

Specifically, depression and general health were identified as having the largest amount of shared variance, which suggests a need to focus on the symptoms as well as indicators of general health. The present study supports previous literature that demonstrates high rates of depression (Argyriou et al., 2011; Knight et al., 1997) and poorer general health (Argyriou et al., 2011; Aronson, 1997; Giordano et al., 2012) among caregivers of MS. This study uniquely contributes to pre-existing literature because it found that depression and general health account for a significant amount of variance, above and beyond what the other mental health (anxiety, satisfaction with life, and self-esteem) and physical variables (bodily pain, performance in physical role, and physical functioning) contributed to the model. Therefore, depression and general health should be the focus of future research in MS caregivers, both as symptoms and indicators of overall health.

The present study found significant correlations between most mental health and physical health variables, with the exception of the following two relations: self-esteem and performance in physical role and satisfaction with life and social support. Mental health and physical health comprise the psychological and biological components of Engel's (1977) Biopsychosocial Model, respectively. This model integrates these two components, as well as the social aspect of

health (in this study, Latino family dynamics). The strong relations that were detected between mental health and physical health in this study further support the use of Engel's model for understanding the overall subjective experiences of caregivers of patients with MS. Focusing solely on mental health or physical health would likely neglect important concepts that are relevant to improving the overall health of caregivers of MS. Specific to future research and interventions, it is key to target these two aspects of health (mental and physical), as well as the social factors that are unique to Latino families.

Demographic Variables and General Health

The exploratory correlation matrix with demographic variables and general health demonstrated significant results, although socioeconomic status was not significantly related to general health. Age, gender, hours per week of caregiving, and duration of caregiving were all inversely related to general health. The number of years of school was positively related to general health. These correlations suggest that younger caregivers, males, those who report fewer hours per week of caregiving, those with more years of education, and those who have been caregiving for a shorter amount of time were more likely to report better general health than the other participants in the study. Seventy-two percent of caregivers surveyed in one study reported that they would have trouble caring for the patients with MS if their own health began to deteriorate (Wollin & Sato, 2001). This suggests that physical health is important to maintain throughout the caregiving process. Furthermore, these findings identify potential areas for future studies to intervene to bolster caregiver health. In sum, it is necessary to provide support and access to services for those caregivers of MS who may be more likely to experience negative health outcomes, particularly because of the impact that their health status has on the patient's care.

Robust findings emerged when demographic variables were entered into the hierarchical multiple regressions. Demographic variables (i.e., gender, age, years of education, number of hours per week of caregiving, and total duration of caregiving) accounted for approximately 14-19% of the variance in anxiety, depression, and self-esteem. Moreover, gender (female) and general health were uniquely related to anxiety, depression, and self-esteem in each of these models. These findings are supported by previous research, which suggests that being a female caregiver may be related to more negative psychological and physical outcomes compared to males, and may also be affected by differences in coping strategies (DeRosier, et al., 1992; Gulick, 1995; Pakenham, 2001; Patti et al., 2007; Rivera-Navarro, et al., 2003). It should also be noted that while caregivers of patients with MS are often males (Kristjansson et al., 2006), nearly 67% of the caregivers in the present study identified as female, which is an important consideration. Furthermore, previous research on Latino caregivers suggests that there are cultural and familial values that are tied to a division of labor, such that women often take on the caregiving role (Ibarra, 2003). Because women tend to report poorer general health than men, and because an overwhelming majority of the caregivers in the present study were women, it will be important to develop interventions that target female caregivers in these populations. Additionally, these findings support previous research that demonstrates how caregiving can negatively impact one's physical health (Argyriou et al., 2011; Aronson, 1997; Giordano et al., 2012; McKeown et al., 2003).

For example, Aronson (1997) surveyed caregivers of MS (50% female) and found that they reported a variety of physical health problems, including arthritis (21%); high blood pressure (11%); heart trouble (9%); respiratory problems (9%); stomach ulcer (5%); kidney, liver, and gallbladder problems (5%), broken bones (2%), and cancer (2%). In addition, 23%

reported two or more health conditions, and 21% reported other unspecified problems. Together, these results highlight the link between caregiving and physical health. Considering those results with the negative health outcomes that emerged in the present study, it seems that more research is necessary to determine ways that caregivers may address their physical health needs and optimize their physical health. In addition, they could explore the needs of female caregivers and barriers to services with the goal of identifying ancillary services that could further support these caregivers.

Burden and Social Support

Surprisingly, burden and social support did not moderate the relation between depression and general health, nor did they moderate the relation between general health and depression in this particular sample. However, there were significant correlations found between burden and several of the mental health and physical health variables that were assessed in the present study. Burden was inversely correlated with bodily pain, general health, performance in physical role, physical functioning, satisfaction with life, self-esteem, and social support. Burden also was positively related to anxiety and depression.

Although burden and social support did not moderate the relation between mental health and physical health within this sample of caregivers of MS, burden was significantly related to several variables. The relation between depression and burden was such that caregivers who reported more burden subsequently endorsed higher levels of depression. A similar pattern emerged with anxiety: caregivers who endorsed higher levels of burden also reported more anxiety. Conversely, burden was negatively related to bodily pain, general health, performance in physical role, physical functioning, self-esteem, social support, and satisfaction with life. It is evident that burden is related to a multitude of deleterious health effects based on the findings

identified in the present study. Because of these findings, it is imperative that we find culturally appropriate ways to reduce burden in caregivers of MS in Latino populations in order to buffer the negative health outcomes associated with caregiving.

Several significant correlations were also detected between social support and mental health and physical health variables. Social support was significantly related to general health, such that those who reported more social support also endorsed greater general health. Positive significant relations were also detected between social support and bodily pain, physical functioning, performance in physical role, and self-esteem. Significant negative relations were found between social support and anxiety, depression, and burden. Social support was not significantly correlated with satisfaction with life. Social support is particularly relevant to caregivers because we know that a lack of social support is related to caregiver burnout and increased burden (Akkuş, 2011; Zarit et al., 1980).

Even though burden and social support did not significantly moderate the relation between depression and general health, nor the relation between general health and depression, it is evident that they are both highly correlated with a multitude of mental health and physical health variables. Burden and social support were simply correlates of depression and general health in the present sample and did not influence the strength of the relation between mental health and physical health variables. Perhaps there are cultural values that influence the strength of the relation between mental health and physical health that are not taken into account by burden and social support, such as the obligation or duty to care for a sick family member that might be more evident in Latino families (Delgado & Tennstedt, 1997; Nápoles et al., 2010; Triandis, 1995). For example, it is reasonable to hypothesize that social support might look different in a Latino family compared to a family that does not have deep-seeded familial

obligations, such that the social support is comprised of family members in Latino populations. Conversely, peers may play a bigger role in social support in other cultural groups. It is also possible that there is an implicit assumption in Latino families that family members will take over as caregivers for their sick family members, which might subsequently affect mental health and physical health, as well as perceived burden. In addition, it is plausible that the way social support was assessed and analyzed in the present study did not capture the familial and cultural obligations faced by these particular caregivers. Given these findings, both of these constructs should continue to be studied given the wealth of research concerning the detrimental health effects of burden (Argyriou et al., 2011; Knight et al., 1997; Rivera-Navarro et al., 2003) and the positive effects and needs of caregivers related to social support (Good et al., 1995; Weinert & Long, 1993).

Caregiver Needs

The broader goal of caregiver research aims to understand how to improve caregiver health and subsequently inform intervention development. Given past research, plus the finding uncovered in the present study, we are now increasing our understanding of this area of study. Studies about caregivers, specifically those caring for an individual with MS, suggest that there are particular needs that they report as important to their health and well-being. Although caregiver needs were not assessed in the present study, we can pull from the needs identified by caregivers in other studies to help us better understand what features might be important to include in an intervention.

While the specific needs of caregivers vary, nearly 1/3 of caregivers of individuals with MS are clinically distressed and report needing assistance with caregiving tasks (Pakenham, 2001). In addition, approximately 61% of the countries included in the 2008 worldwide report on

MS indicated that family members and caregivers did not receive respite care (WHO & MSIF, 2008).

A recent study examined the most and least important needs of caregivers of individuals with MS in Mexico (Arango-Lasprilla, Premuda, Aguayo, Rancis, Macias, & Villaseñor, 2010). The needs that received the highest scores mostly fell within the category of “interdependence,” while the needs that received the lowest scores were scattered across multiple categories, including “self-concept,” “physical,” and “role function.” High endorsement of a need for interdependence is critical to note given findings that social isolation is related to an increase in caregiver burnout among caregivers of MS (Akkuş, 2011). The caregivers assessed in the present study endorsed results that are complimentary to previous research. In this case, higher levels of social support were related to better general health and more self-esteem, as well as less anxiety, depression, and burden. This suggests that by increasing the amount of social support these caregivers receive, mental health and physical health could subsequently be improved. Given this background, we can presume that these caregivers are likely to experience greater social support when their needs are met. In turn, this could then be associated with more positive mental health and physical health.

Another study examined the needs of caregivers of MS and whether the caregivers perceived that their needs were being met (Sato, Ricks, & Watkins, 1996). In this study, the caregivers indicated that most of their needs were being met, partially because they reported that they were receiving help with their caregiving duties, mostly from other family members. The caregivers did report, however, that they were in need of rest and relaxation, help with meal preparation, help with financial needs, and help with housekeeping chores.

McKeown, Porter-Armstrong, and Baxter (2004) conducted a series of focus groups with 16 participants in Northern Ireland and the Republic of Ireland that attempted to further understand the progression of needs in caregivers of individuals with MS. Overall, the qualitative results suggested that caregivers tend to prefer to manage the caregiving role themselves for as long as possible, and only when they feel as though they cannot fully manage the tasks and duties associated with their roles any more, do they attempt to find informal and formal support. At this point, many reported that they had trouble finding consistent, helpful informal support, which often led them to seek out formal support. In addition, they indicated the difficulty associated with procuring formal support, and noted barriers in doing so (e.g., lack of information about formal support, drawn out waiting time for services, bureaucratic issues). Moreover, Nodder and colleagues (2000) call for “specialized care” and suggest that future care and services involve the families and patients themselves, not just the professionals involved in disease diagnosis and management, as the individual needs of those involved are critical (e.g., economic considerations, wait times, availability of respite care, information about the disease).

Although caregiver needs is outside the scope of the present study, the available research on caregiver needs suggests that caregiver needs often go unmet. In turn, not having their needs met likely negatively impacts caregiver health. Based on the results identified in the present study, it is plausible that not getting one’s needs met is associated with poorer mental health and physical health. This is particularly problematic given that caregivers commonly report that their needs are not being fulfilled. Thus, it is important to incorporate the findings in the present study that highlight specific variables that are related to better mental health and physical health outcomes with research that highlights the needs identified by caregivers of MS, particularly those in Mexico. Considering the findings of the previously outlined studies, one might conclude

that caregivers of MS in this population would similarly experience these needs, including interdependence, rest and relaxation, help with meal preparation, help with financial needs, help with housekeeping chores, and help finding formal caregiving services. Because health and well-being involves biological, psychological, and social components, it will be important for future studies to examine how these pieces interrelate in order to help meet caregiver needs.

Positive Aspects of Caregiving for Future Exploration

The present study focused on the ways in which caregiving for a patient with MS is associated with specific mental health and physical health outcomes. To date, most caregiving research tends to focus on the unmet needs and deleterious effects of caring for someone with an injury or illness, though little research has targeted the positive aspects of this role. The positive aspects of caregiving are thus highlighted below as one possibility for future exploration in the field of caregiver research.

Parveen, Morrison, and Robinson (2011) conducted a small qualitative study in the United Kingdom in which the caregivers described the negative outcomes associated with caregiving, but they also consistently highlighted the gains associated with their roles. Parveen and Morrison (2012) built upon the qualitative study and conducted a longitudinal study with caregivers who had been in their roles for at least seven months to examine the gains associated with caregiving, and included assessment at three time points (baseline, 3 months post-baseline, and 9 months post-baseline). In this study, the patients were diagnosed with Parkinson's disease, multiple sclerosis, dementia, other, stroke, and cancer, respectively. Overall, caregiver gains remained consistent over time. In addition, familism decreased over time, which was associated with positive gains at the second and third time points. Moreover, British South-Asian caregivers in this study endorsed more overall gains than the White-British caregivers. In combination, the

British South-Asian caregivers endorsed higher levels of familism than White-British caregivers in the Parveen and Morrison (2011) study, and then the same pattern emerged in overall gains, which hints at the relevance of culture and ethnicity when evaluating the psychological effects (both positive and negative) of caregiving. Even though familism was not assessed in the present study, it is a construct that is relevant to Latino populations (Delgado & Tennstedt, 1997; Nápoles et al., 2010) and should be considered when targeting the mental health and physical health of caregivers of MS.

Buchanan and Huang (2012) conducted a study specific to caregivers of MS in the United States that looked at perceptions of accomplishment related to caregiving. They identified two main factors that related to positive perceptions: age of the patient with MS and the number of hours per week that the caregivers provided care to the patients. Contrary to those findings, caregivers' perceptions of caring for the patients, relationship to the patient, and caregiver education level were significantly indicative of negative perceptions of caregiving. Specifically, the caregivers who viewed their roles as "emotionally draining," those who were the patients' spouses, and caregivers with less education endorsed more of these negative perceptions. Given the limited research on resilience and positive perceptions of caregiving in this field, it may be necessary to further expand the literature base in order to understand the situations in which some caregivers fare better than others, instead of solely focusing on the negative impacts associated with caregiving.

In sum, while the present study did not directly examine positive aspects of caregiving, this area of caregiver research is relevant and potentially important to explore in future studies. In addition, caregiver needs should be examined in Latino populations to understand how culture may affect the needs that caregivers report as most important to their health. Related to the

positive aspects of caregiving, it is possible that there are positive outcomes associated with caregiving in Latino populations that were not assessed in the present study. For example, it could be that caring for a family member further strengthens the bond within a family. This may be particularly beneficial in Latino families given the emphasis that is placed on these close relationships. Perhaps gaining additional understanding regarding the benefits that caregivers report during and after caring for loved ones could be beneficial. These studies could highlight protective factors or positive outcomes that are unique to some individuals or groups of caregivers in Latin regions. In turn, these positive outcomes may shed light on instances when caregivers of MS are more likely to be resilient in the face of hardship.

Strengths

One of the major strengths of this study is that the data were collected and closely examined so that researchers could follow up with participants who did not initially provide all of the necessary data. The dataset was missing very little information because of the thorough data collection process that was followed. In addition, it is a very rich dataset and includes several different measures that assess patient qualities, as well as caregiver qualities. Eighty-one participants were included in the sample that was analyzed for this study, which is large for this specific disease population, particularly in Mexico. The sample size in the present study had sufficient power to run analyses and create models necessary for the specific aims and hypotheses that were identified. Last, there are a limited number of studies that examine caregivers of individuals with MS, and there are even fewer specific to Latin American regions. In this sense, it is a unique dataset that will allow for the dissemination of novel ideas and information to the fields of caregiver, MS, and Latino research.

Limitations

While there are several strengths associated with these data and the present study, there are also some notable limitations. First, this study did not include a measure of familism or role engulfment, which makes it hard to understand the variability that might exist within this sample of Latinos. For example, the Heller Familism Scale (Heller, 1976) and the familism scale (FS) by Sabogal and colleagues (1987) both assess familism, though no comparable measures were utilized in this study. Furthermore, even though this is a Latino sample, it cannot be assumed that the results found in the present study are indicative of all Latino caregivers, given that there is a lot of variability within this population. Findings from the same participants are in the process of being published elsewhere, which subsequently limited the analyses that could be conducted in the present study. The nature of the data collection was also limited. In particular, the cross-sectional data is correlational in nature, which is a disadvantage. We know that there are significant relations between numerous variables, but the inability to say that one variable is predictive of another variable is not appropriate given the nature of the present study and the analyses that were computed. These are all important considerations to take into account in the present study.

Conclusion

The present study provided several robust findings that will be important to incorporate into future studies and interventions concerning caregivers of MS, particularly in Mexico and among other Latino populations. Based on the theoretical underpinnings within the Biopsychosocial Model (Engel, 1977), it is critical that caregivers' mental health and physical health, as well as the relevant Latino family dynamics are taken into account in order to improve caregivers' overall health and well-being. This model allows us to recognize an individual's subjective experience, in this case, as a caregiver of a patient with MS (Borrell-Carrió et al.,

2004). Incorporating all aspects of an individual's subjective experience is crucial because we know that all of these factors are interrelated and subsequently affect overall health.

Based on the present study, we know that demographic variables explained a significant amount of variance in mental health outcomes among these caregivers, particularly female gender, which suggests that targeting females may be beneficial in and of itself. In addition, general health was uniquely associated with mental health outcomes in multiple analyses. Furthermore, the results from the canonical correlation suggest that interventions that target mental health and physical health concurrently will be important. While burden and social support did not moderate the relations between depression and general health and general health and depression, future research should continue to explore these constructs because they were significantly related to most mental health and physical health outcomes in the present study, and they are prevalent outcomes in previous research involving caregiver populations (Argyriou et al., 2011; Good et al., 1995; Knight et al., 1997; Rivera-Navarro et al., 2003; Weinert & Long, 1993). Last, while the results presented in the current study are not without limitations, they should be understood in combination with other research in this field in order to further the pre-existing knowledge base about caregivers of patients with MS, given that caregiver health subsequently affects patient health (McKeown et al., 2003).

List of References

List of References

- Akkuş, Y. (2011). Multiple sclerosis patient caregivers: The relationship between their psychological and social needs and burden levels. *Disability and Rehabilitation: An International, Multidisciplinary Journal*, 33(4), 326-333.
- Alonso, J., Prieto, L., & Anto, J. M. (1995). The Spanish version of the SF-36 health survey (the SF-36 health questionnaire): An instrument for measuring clinical results. *Medicina Clinica (Barc)*, 104, 771-776.
- Anson, K., & Ponsford, J. (2006). Coping and emotional adjustment following traumatic brain injury. *The Journal of Head Trauma Rehabilitation*, 21(3), 248-259.
- Arango-Lasprilla, J. C., Plaza, S. L., Drew, A., Romero, J. L., Pizarro, J. A., Francis, K., et al. (2010). Family needs and psychosocial functioning of caregivers of individuals with spinal cord injury from Colombia, South America. *Neurorehabilitation*, 27(1), 83-93.
- Arango-Lasprilla, J. C., Premuda, P., Aguayo, A., Francis, K., Macias, M. A., & Villaseñor, T. (2010). Needs and psychosocial outcomes of caregivers of individuals with multiple sclerosis in Guadalajara, Mexico. *International Journal of MS Care*, 12, 71-82.
- Arango-Lasprilla, J. C., Nicholls, E., Cabrera, T. V., Drew, A., Jimenez-Maldonado, M., & Martinez-Cortes, M. L. (2011). Health-related quality of life in caregivers of individuals with traumatic brain injury from Guadalajara, Mexico. *Journal of Rehabilitation Medicine*, 43(11), 983-986.
- Argyriou, A. A., Karanasios, P., Ifanti, A. A., Iconomou, G., Assimakopoulos, Makridou, A., et al. (2011). Quality of life and emotional burden of primary caregivers: A case-control study of multiple sclerosis patients in Greece. *Quality of Life Research*, 20(10), 1663-1668.
- Aronson, K. J. (1997). Quality of life among persons with multiple sclerosis and their caregivers. *Neurology*, 48(1), 74-80.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Borrell-Carrió, F., Suchman, A. L., & Epstein, R. M. (2004). The biopsychosocial model 25 years later: Principles, practice, and scientific inquiry. *Annals of Family Medicine*, 2(6), 576-582.
- Brannan, A. M., Athay, M. M., & Vides de Andrade, A. R. (2012). Measurement quality of the caregiver strain questionnaire-short form 7 (CGSQ-SF7). *Administration and Policy in Mental Health and Mental Health Services Research*, 39(1-2), 51-59.

- Buchanan, R. J., Radin, D., Chakravorty, B. J., & Tyry, T. (2009). Informal caregiving to more disabled people with multiple sclerosis. *Disability and Rehabilitation: An International, Multidisciplinary Journal*, 31, 1244-1256.
- Buchanan, R. J., & Huang, C. (2011). Health-related quality of life among informal caregivers assisting people with multiple sclerosis. *Disability and Rehabilitation*, 33(2), 113-121.
- Buchanan, R. J., & Huang, C. (2012). Caregiver perceptions of accomplishment from assisting people with multiple sclerosis. *Disability and Rehabilitation*, 34(1), 53-61.
- Buhse, M. (2008). Assessment of caregiver burden in families of persons with multiple sclerosis. *Journal of Neuroscience Nursing*, 40(1), 25-31.
- Chelune, G. J., Stott, H., & Pinkston, J. (2008). Multiple sclerosis. In J. E. Morgan, & J. H. Ricker (Eds.), *Textbook of clinical neuropsychology* (pp. 599-615). New York, NY: Taylor and Francis.
- Chipchase, S. Y., & Lincoln, N. B. (2001). Factors associated with carer strain in carers of people with multiple sclerosis. *Disability and Rehabilitation: An International, Multidisciplinary Journal*, 23(17), 768-776.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cohen, S., Mermelstein, R., Kamarck, T., & Hoberman, H. M. (1985). Measuring the functional components of social support. In I. G. Sarason, & B. R. Sarason (Eds.), *Social support: Theory, research and applications* (pp. 73-94). Dordrecht: Martinus Nijhoff Publishers.
- Coon, D. W., Rubert, M., Solano, N., Mausbach, B., Kraemer, H., Arguëlles, T., et al. (2004). Well-being, appraisal, and coping in Latina and Caucasian female dementia caregivers: Findings from the REACH study. *Aging & Mental Health*, 8(4), 330-345.
- Corona, T., & Roman, G. C. (2006). Multiple sclerosis in Latin America. *Neuroepidemiology*, 26(1), 1-3.
- Courts, N., Newton, A., & McNeal, L. (2005). Husbands and wives living with multiple sclerosis. *Journal of Neuroscience Nursing*, 37(JISOFJSD), 20-27.
- Covinsky, K. E., Newcomer, R., Fox, P., Wood, J., Sands, L., Dane, K., et al. (2003). Patient and caregiver characteristics associated with depression in caregivers of patients with dementia. *Journal of General Internal Medicine*, 18(12), 1006-1014.
- Cox, C., & Monk, A. (1993). Hispanic culture and family care of alzheimer's patients. *Health & Social Work*, 18(2), 92-100.
- Delgado, M., & Tennstedt, S. (1997). Making the case for culturally appropriate community services: Puerto Rican elders and their caregivers. *Health & Social Work*, 22(4), 246-255.

- DeRosier, M. B., Catanzaro, M., & Piller, J. (1992). Living with chronic illness: Social support and the well spouse perspective. *Rehabilitation Nursing, 17*(2), 87-91.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71-75.
- Diez-Quevedo, C., Rangil, T., Sanchez-Planell, L., Kroenke, K., & Spitzer, R. L. (2001). Validation and utility of the patient health questionnaire in diagnosing mental disorders in 1003 general hospital Spanish inpatients. *Psychosomatic Medicine, 63*(4), 679-686.
- Dillehay, R., & Sandys, M. (1990). Caregivers for alzheimer's patients: What we are learning from research. *International Journal of Aging and Human Development, 30*(4), 263-285.
- Dilworth-Anderson, P., Williams, I. C., & Gibson, B. E. (2002). Issues of race, ethnicity, and culture in caregiving research. *The Gerontologist, 42*(2), 237-272.
- Dunn, J. (2010). Impact of mobility impairment on the burden of caregiving in individuals with multiple sclerosis. *Expert Review of Pharmacoeconomics and Outcomes Research, 10*(4), 433-440.
- Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science, 196*(4286), 129-136.
- Finlayson, M., & Cho, C. (2008). A descriptive profile of caregivers of older adults with MS and the assistance they provide. *Disability and Rehabilitation: An International, Multidisciplinary Journal, 30*(24), 1848-1857.
- Fox, R. J., & Cohen, J. A. (2001). Multiple sclerosis: The importance of early recognition and treatment. *Cleveland Clinical Journal of Medicine, 68*, 157-171.
- Giordano, A., Ferrari, G., Radice, D., Randi, G., Bisanti, L., & Solari, A. (2012). Health-related quality of life and depressive symptoms in significant others of people with multiple sclerosis: A community study. *European Journal of Neurology, 19*(6), 847-854.
- Gonzalez, O., & Sotelo, J. (1995). Is the frequency of multiple sclerosis increasing in Mexico? *Journal of Neurology, Neurosurgery & Psychiatry, 59*(5), 528-530.
- Good, D. M., Bower, D. A., & Einsporn, R. L. (1995). Social support: Gender differences in multiple sclerosis spousal caregivers. *Journal of Neuroscience Nursing, 27*(5), 305-311.
- Gray-Little, B., Williams, V. S. L., & Hancock, T. D. (1997). An item response theory analysis of the Rosenberg self-esteem scale. *Personality and Social Psychology Bulletin, 23*(5), 443-451.
- Gulick, E. E. (1995). Coping among spouses or significant others of persons with multiple sclerosis. *Nursing Research, 44*(4), 220-225.

- Gupta, S., Goren, A., Phillips, A. L., & Stewart, M. (2012). Self-reported burden among caregivers of patients with multiple sclerosis. *International Journal of MS Care, 14*(4), 179-187.
- Heller, P. L. (1976). Familism scale: Revalidation and revision. *Journal of Marriage and the Family, 38*(3), 423-429.
- Hoening, J., & Hamilton, M. W. (1966). The schizophrenia patient in the community and his effect on the household. *International Journal of Social Psychiatry, 12*(3), 165-176.
- Houtchens, M. K., Lublin, F. D., Miller, A. E., & Houry, S. J. (2008). Multiple sclerosis and other inflammatory demyelinating diseases of the central nervous system. In R. B. Daroff, G. M. Fenichel, J. Jankovic & J. C. Mazziotta (Eds.), *Bradley's neurology in clinical practice* (6th ed., pp. 1283-1313). Philadelphia, PA: Elsevier Saunders.
- Ibarra, M. L. (2003). The tender trap: Mexican immigrant women and the ethics of elder care work. *Atzlan: A Journal of Chicano Studies, 28*(2), 87-113.
- Karlikaya, G., Yukse, G., Varlibas, F., & Tireli, H. (2005). Caregiver burden in dementia: A study in the Turkish population. *The Internet Journal of Neurology, 4*(2), 12-26.
- Khan, F., Pallant, J., & Brand, C. (2007). Caregiver strain and factors associated with caregiver self-efficacy and quality of life in a community cohort with multiple sclerosis. *Disability and Rehabilitation: An International, Multidisciplinary Journal, 29*(16), 1241-1250.
- Knight, R. G., Devereux, R. C., & Godfrey, H. P. D. (1997). Psychosocial consequences of caring for a spouse with multiple sclerosis. *Journal of Clinical and Experimental Neuropsychology, 19*(1), 7-19.
- Kristjanson, L. J., Aoun, S. M., & Yates, P. (2006). Are supportive services meeting the needs of Australians with neurodegenerative conditions and their families? *Journal of Palliative Care, 22*(3), 151-157.
- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606-613.
- Lazarus, R. S., & Folkman, S. (1984). *Psychological stress and the coping process*. New York, NY: Springer.
- Magaña, S. M., García, J. I. R., Hernández, M. G., & Cortez, R. (2007). Psychological distress among Latino family caregivers of adults with schizophrenia: The roles of burden and stigma. *Psychiatric Services, 58*(3), 378-384.
- Marín, M. (1996). Adaptación para nuestro medio de la Escala de sobrecarga del cuidador de Zarit. *Revista multidisciplinar de gerontología, 6*(4), 338.
- Mayo Clinic. (2010). *Multiple sclerosis: Basics*. Retrieved October 19, 2012, from <http://www.mayoclinic.com/health/multiple-sclerosis/DS00188>

- McHorney, C. A., Ware, J. E., & Raczek, A. E. (1993). The MOS 36-item short-form health survey (SF-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs. *Medical Care, 31*(3), 247-263.
- McKeown, L. P., Porter-Armstrong, A., & Baxter, G. D. (2003). The needs and experiences of caregivers of individuals with multiple sclerosis: A systematic review. *Clinical Rehabilitation, 17*(3), 234-248.
- McKeown, L. P., Porter-Armstrong, A., & Baxter, G. D. (2004). Caregivers of people with multiple sclerosis: Experiences of support. *Multiple Sclerosis Journal, 10*(2), 219-230.
- Mutch, K. (2010). In sickness and in health: Experience of caring for a spouse with MS. *British Journal of Nursing, 19*(4), 214-219.
- Nápoles, A. M., Chadiha, L., Eversley, R., & Moreno-John, G. (2010). Developing culturally sensitive dementia caregiver interventions: Are we there yet? *American Journal of Alzheimer's Disease and Other Dementias, 25*(5), 389-406.
- National Institutes of Health: National Institute of Neurological Disorders and Stroke. (2012). *Multiple sclerosis: Hope through research*. Retrieved October 19, 2012, from http://www.ninds.nih.gov/disorders/multiple_sclerosis/detail_multiple_sclerosis.htm#210733215
- Neri, A. L., Yassuda, M., Fortes-Burgos, A., Mantovani, E. P., Arbex, F. S., de, S. T., et al. (2012). Relationships between gender, age, family conditions, physical and mental health, and social isolation of elderly caregivers. *International Psychogeriatrics, 24*(3), 472-483.
- Nodder, D., Chappell, B., Bates, D., Freeman, J., Hatch, J., Keen, J., et al. (2000). Multiple sclerosis: Care needs for 2000 and beyond. *Journal of the Royal Society of Medicine, 93*(5), 219-224.
- Novy, D. M., Nelson, D. V., Smith, K. G., Rogers, P. A., & Rowzee, R. D. (1995). Psychometric comparability of the English-and Spanish-language versions of the State-Trait Anxiety Inventory. *Hispanic Journal of Behavioral Sciences, 17*(2), 209-224.
- O'Brien, R. A., Wineman, N. M., & Nealon, N. R. (1995). Correlates of the caregiving process in multiple sclerosis. *Scholarly Inquiry for Nursing Practice, 9*(4), 323-338.
- O'Connor, P. (2002). Key issues in the diagnosis and treatment of multiple sclerosis: An overview. *Neurology, 59*(Suppl. 3), S1-S3.
- Pakenham, K. I. (2001). Application of a stress and coping model to caregiving in multiple sclerosis. *Psychology, Health & Medicine, 6*(1), 13-27.
- Pakenham, K. I. (2005). Relations between coping and positive and negative outcomes in carers of persons with multiple sclerosis (MS). *Journal of Clinical Psychology in Medical Settings, 12*(1), 25-38.

- Patti, F., Amato, M. P., Battaglia, M. A., Pitaro, M., Russo, P., Solaro, C., et al. (2007). Caregiver quality of life in multiple sclerosis: A multicentre Italian study. *Multiple Sclerosis, 13*(3), 412-419.
- Parveen, S., & Morrison, V. (2009). Predictors of familism in the caregiver role: A pilot study. *Journal of Health Psychology, 14*(8), 1135-1143.
- Parveen, S., Morrison, V., & Robinson, C. A. (2011). Ethnic variations in the caregiver role: A qualitative study. *Journal of Health Psychology, 16*(6), 862-872.
- Parveen, S., & Morrison, V. (2012). Predicting caregiver gains: A longitudinal study. *British Journal of Health Psychology, 17*(4), 711-723.
- Pavot, W., & Diener, E. (1993). Review of the satisfaction with life scale. *Psychological Assessment, 5*(2), 164-172.
- Perrin, P. B., Heesacker, M., Uthe, C. E., & Rittman, M. R. (2010). Caregiver mental health and racial/ethnic disparities in stroke: Implications for culturally sensitive interventions. *Rehabilitation Psychology, 55*(4), 372-382.
- Polman, C. H., Reingold, S. C., Banwell, B., Clanet, M., Cohen, J. A., Filippi, M., et al. (2011). Diagnostic criteria for multiple sclerosis: 2010 revisions to the McDonald criteria. *Annals of Neurology, 69*(2), 292-302.
- Pons, D., Atienza, F. L., Balaguer, I., & García-Merita, M. L. (2000). Satisfaction with life scale: Analysis of factorial invariance for adolescents and elderly persons. *Perceptual and Motor Skills, 91*(1), 62-68.
- Popkin, M. K., & Tucker, G. J. (1994). Mental disorders due to a general medical condition and substance-induced disorders; mood anxiety; psychotic, and personality disorders. DSM-IV sourcebook. Washington (DC): APA Office of Research, p. 243-276.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments & Computers, 36*(4), 717-731.
- Rivera-Navarro, J., Morales-González, J. M., & Benito-Leon, J. (2003). Informal caregiving in multiple sclerosis patients: Data from the Madrid demyelinating disease group study. *Disability and Rehabilitation: An International, Multidisciplinary Journal, 25*(18), 1057-1064.
- Rosenberg, M. (1965). *Society and the adolescent child*. Princeton, NJ: Princeton University Press.
- Rugulies, R. (2002). Depression as a predictor for coronary heart disease: A review and meta-analysis. *American Journal of Preventive Medicine, 23*(1), 51-61.

- Sabogal, F., Marino, G., Otero-Sabogal, R., Marin, B. V., & Perez-Stable, E. J. (1987). Hispanic familism and acculturation: What changes and what doesn't? *Hispanic Journal of Behavioral Sciences*, 9(4), 397-412.
- Sato, A., Ricks, K., & Watkins, S. (1996). Needs of caregivers of clients with multiple sclerosis. *Journal of Community Health and Nursing*, 13(1), 31-42.
- Schmitt, D. P., & Allik, J. (2005). Simultaneous administration of the Rosenberg self-esteem scale in 53 nations: Exploring the universal and culture-specific features of global self-esteem. *Journal of Personality and Social Psychology*, 89(4), 623-642.
- Shurgot, G. S. R., & Knight, B. G. (2004). Preliminary study investigating acculturation, cultural values, and psychological distress in Latino caregivers of dementia patients. *Journal of Mental Health and Aging*, 10(3), 183-194.
- Skaff, M. M., & Pearlin, L. I. (1992). Caregiving: Role engulfment and the loss of self. *The Gerontologist*, 32(5), 656-664.
- Spielberger, C. D., & Díaz-Guerrero, R. I. (1975). Inventario de ansiedad: rasgo-estado. *México: El Manual Moderno*.
- Spielberger, G. (1983). Manual for the state-trait anxiety inventory. *Mind Garden, Menlo Park, CA*.
- Spielberger, C. D. (2010). State-Trait Anxiety Inventory. *Corsini Encyclopedia of Psychology*.
- Triandis, H. C. (1995). *Individualism & collectivism*. Boulder, CO, US: Westview Press.
- Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36): I. conceptual framework and item selection. *Medical Care*, 30(6), 473-483.
- Ware, J. E., Kosinski, M., & Keller, S. D. (1994). *SF-36 physical and mental health summary scales: A users' manual*. Boston: The Health Institution.
- Weinert, C., & Long, K. A. (1993). Support systems for the spouses of chronically ill persons in rural areas. *Family and Community Health*, 16(1), 46-54.
- Wollin, J., & Sato, A. (2001). An international comparison of caregiver burden in multiple sclerosis. *Australas Journal of Neuroscience*, 14, 21-25.
- World Health Organization, & Multiple Sclerosis International Federation. (2008). *Atlas: Multiple sclerosis resources in the world* (Data. Geneva, Switzerland: World Health Organization).
- Zarit, S. H., Reever, K. E., & Bach-Peterson, J. (1980). Relatives of the impaired elderly: Correlates of feelings of burden. *The Gerontologist*, 20(6), 649-655.

Vita

Gillian Goodman Leibach was born on March 10, 1987 in Washington, D.C., and is an American citizen. She graduated from the Maret School, Washington, D.C. in 2005. She received her Bachelor of Arts in Psychology from Bates College, Lewiston, Maine in 2009.