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Caregiving stress and self-rated health during the COVID-19 pandemic: The mediating role of resourcefulness

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Abstract

Family caregivers faced unprecedented circumstances and experienced increased levels of stress during the COVID-19 pandemic. Resourcefulness can minimize the effect of stress on health outcomes. The purpose of this study was to examine the associations between caregiving stress during the pandemic, resourcefulness, and self-rated health and assess the mediating effect of resourcefulness. A convenience sample of 70 family caregivers of adults with chronic and/or disabling conditions was recruited using social media groups and professional networking platforms. Data were collected using an online survey and analyzed using linear regression. Mediation analysis was conducted using the PROCESS macro. Higher levels of caregiving stress during the pandemic and lower levels of resourcefulness were associated with worse self-rated health, while controlling for age, employment status, and weekly caregiving hours. Resourcefulness mediated the relationship between caregiving stress and self-rated health. Our findings highlight the importance of assessing the psychological impact of the pandemic on family caregivers' outcomes. Resourcefulness skills can be targeted to improve the health and well-being of family caregivers during and beyond the pandemic.

Keywords

Family caregivers; COVID-19 pandemic; caregiving stress; resourcefulness

Introduction

About 48 million people in the United States are providing unpaid care to an adult family member or friend (American Association of Retired Persons [AARP] & National Alliance for Caregiving [NAC], 2020). Family caregivers greatly contribute to the care of adults with

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chronic illness, often at the expense of their own health and well-being. They often report adverse health outcomes, specifically high levels of physical and emotional strain resulting from caregiving (Schulz et al., 2020). Since the coronavirus disease 2019 (COVID-19) was declared as a pandemic by the World Health Organization, family caregivers have experienced several challenges while caring for their loved ones and adapting to the new social restrictions (Irani et al., 2021). The unprecedented stress associated with the pandemic may have heightened their risk for poor health outcomes.

Early research about family caregivers' health outcomes during the pandemic demonstrated that they continued to have worse psychological distress and fatigue compared to non-caregivers (Park, 2020), and that their stress and pain levels were greater during the pandemic (Sheth et al., 2021). Family caregivers have been severely affected by the COVID-19 pandemic for several reasons. First, the existing caregiving challenges have been exacerbated by the restrictions that were placed as a result of the pandemic. Many home- and community-based services were reduced or suspended (Greenberg et al., 2020). Moreover, some family caregivers and care recipients had limited contact with other family members who had previously assisted in sharing some responsibilities with the primary caregiver and relieving some of the caregiving stress (Savla et al., 2020). Therefore, family caregivers had less access to supportive resources during the pandemic and needed to assume additional responsibilities within a short period. Second, family caregivers have provided care for individuals at high risk for severe illness and adverse health outcomes from COVID-19 (Tisminetzky et al., 2020), which represents an additional stressor for the caregiving experience. Last, the social distancing requirements and the shift to remote work and schooling may have contributed to an increase in stress levels, feelings of isolation, and decreased opportunities to manage mental health (Davidson et al., 2020). Therefore, within the context of the pandemic, family caregivers can be perceived as a high-risk population given the physical and psychological toll that the pandemic and its associated restrictions has had on their health and well-being.

According to Resourcefulness Theory, resourcefulness is believed to minimize the impact of stress on health and health outcomes (Zauszniewski, 2012). The existing research on resourcefulness across caregiving populations supports its benefits for mental health and well-being (Musil et al., 2009; Toly & Musil, 2015; Zauszniewski & Burant, 2020). Resourcefulness has also been positively linked to self-rated health among caregivers of persons with autism spectrum disorder (Bekhet, 2014). Additionally, Guo et al. (2019) recently established resourcefulness as a mediator between perceived stress and mental health outcomes. There is a lack of evidence about the importance of resourcefulness in the context of a global health crisis, such as the COVID-19 pandemic. The literature about coping mechanisms during the pandemic provides supportive and promising evidence about the role of positive coping behaviors in adaptation to COVID-related stress and their association with positive health outcomes (Fullana et al., 2020; Minahan et al., 2020). Therefore, resourcefulness can be considered a coping mechanism for family caregivers during the ongoing COVID-19 pandemic and may be related to their general well-being.

The purpose of this study was to: (a) examine whether caregiving stress during the COVID-19 pandemic and resourcefulness contribute to self-rated health among family

caregivers, and (b) examine the role of resourcefulness as a mediator in the relationship between caregiving stress and self-rated health. We hypothesized that higher caregiving stress during the pandemic and lower resourcefulness levels would be associated with poorer self-rated health. We also hypothesized that resourcefulness would mediate the relationship between caregiving stress and self-rated health. Self-rated health has been widely used as a global indicator of health and is associated with chronic diseases and symptoms, healthcare utilization, and mortality (Assari et al., 2020; DeSalvo et al., 2006; Han et al., 2018; Miilunpalo et al., 1997; Molarius & Janson, 2002). Therefore, the findings of this study can highlight potential intervening points to offset the negative effects of the pandemic on family caregivers on the short and long terms.

Methods

Design and Sample

In this cross-sectional study, participants were invited to complete an internet-based survey between May and September 2020 if they met the following inclusion criteria: 1) 18 years of age or older, 2) living in the United States, 3) providing care for a community-dwelling adult relative or friend with an existing chronic or disabling condition, and 4) able to read, speak, and understand English. The survey was designed to capture family caregiving experiences and stressors during the COVID-19 pandemic. The study protocol (STUDY20200512) was approved by the Institutional Review Board at Case Western Reserve University and considered to be exempt.

Participants were recruited through electronic methods by posting study information on professional networking platforms and social media groups. Participants were also encouraged to share the study information with others who may be interested. Participants accessed the study information using a REDCap link and provided consent by acknowledging their agreement to complete the survey on the first page. After completing the survey, participants were offered a chance to enter in a random drawing for one of four $25 gift cards.

Data Collection and Measures

Data were collected using an anonymous REDCap survey. Participants were asked to complete demographic questions about their age (in years), gender, race, ethnicity, marital status, educational attainment, employment status, and changes to their employment since the beginning of the pandemic. Moreover, they completed questions about their caregiving role, such as the number of years they have been assisting their loved one with care needs, the weekly time spent on caregiving activities, and the caregiving tasks they have been performing since the beginning of the pandemic. These caregiving variables indicate the chronicity of the caregiving stressors that the family caregiver had experienced. Last, participants reported information about the care recipient, such as demographic and clinical characteristics, and the home- and community-based services that the care recipient usually receives.

Self-rated health was assessed using the single item: "In general, would you say your health is?" with response options "excellent", "very good", "good", "fair", or "poor". A higher rating indicates better self-rated health. The use of this single-item measure is a well-established approach to assess overall self-rated health and has been widely adopted in family caregiving studies (Rozario & Simpson, 2018; Washington et al., 2018; Xian & Xu, 2019). This measure has good test-retest reliability (Lundberg & Manderbacka, 1996) and has been shown to predict mortality risk across multiple studies (DeSalvo et al., 2006).

Caregiving stress was assessed by asking participants about the level of stress that is associated with providing care to their loved one during the COVID-19 pandemic. Participants rated their level of caregiving stress during the pandemic on a 5-point Likert scale (1 = *Not Stressful* to 5 = *Extremely Stressful*). This measure is similar to the single-item stress measures that are used in the Health and Retirement Study to assess the level of stress that is associated with different stressors, including helping a loved one on a regular basis (Smith et al., 2017).

Resourcefulness was measured using the 28-item Resourcefulness Scale that targets personal (16 items) and social (12 items) dimensions of resourcefulness (Zauszniewski et al., 2006). Personal resourcefulness items included questions about the use of personal strategies (i.e., thinking positively, keeping busy) when confronting an adversity. Social resourcefulness items focused on seeking help from others when facing a challenge. Participants indicated how much each statement was descriptive of them on a 6-point Likert scale (0 = *not at all like me* to 5 = *very much like me*). Total resourcefulness scores ranged between 0–140, with higher scores indicating greater resourcefulness. Construct validity has been established using confirmatory factor analysis, which demonstrated two distinct dimensions reflecting personal and social resourcefulness (Zauszniewski et al., 2006). The resourcefulness scale has been used in studies with family caregivers and its internal consistency has been established with Cronbach's alpha ranging from .81 to .87 (Musil et al., 2021; Toly & Musil, 2015; Zauszniewski et al., 2018). In the present sample, the internal consistency reliability (Cronbach's alpha) was .89.

Data Analysis

Data were analyzed using the IBM SPSS statistics software package, version 27 (Chicago, IL, USA). Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to characterize the sample and describe study variables. Pearson product–moment correlations were used to examine bivariate relationships between caregiving stress, resourcefulness, and self-rated health. To evaluate the normality of self-rated health, skewness and kurtosis univariate indices were considered.

The first aim of this study was addressed using hierarchical linear regression to determine whether caregiving stress during the COVID-19 pandemic and resourcefulness contribute to self-rated health. Before conducting the regression analysis, the assumptions of ordinary least squares linear regression were assessed. The data were screened and no violations of the assumptions were identified. Bivariate correlation analyses were also performed between key variables. The model was built in three steps. First, self-rated health was estimated from the covariates: age (in years), employment status (0 = unemployed, 1 = employed),

and weekly caregiving hours (0 = less than or equal to 20 hours, 1 = 21 hours or more). Caregiving stress was entered in the second step, and resourcefulness was entered in the third step. We examined the squared multiple correlation (R^2) at each step to evaluate the proportion of total variance in self-rated health that is explained by each set of predictors. We also evaluated the change in R^2 at each step and determined the significance of our models. The level of statistical significance was set to $p < .05$.

To address the second aim of this study, a mediation analysis was conducted using linear regression and performed using the PROCESS version 3.5 macro that is recommended to estimate direct and indirect effects of study variables (Hayes, 2017). Regression coefficients were calculated for each pathway: (1) caregiving stress → resourcefulness (*a*); (2) resourcefulness → self-rated health (*b*); (3) caregiving stress → self-rated health (total effect; *c*), and; (4) caregiving stress → self-rated health (direct effect; *c'*). The mediation effect represents the indirect effect of the independent variable (caregiving stress) on the outcome (self-rated health) and is the product of two path coefficients ($a \times b$). The mediation effect was examined using the bootstrapping method based on PROCESS, as proposed by Hayes (2017). Significance of unstandardized parameter estimates (B) and 95% bias-corrected confidence intervals (95% CI) for the indirect effect (*ab*) were generated based on 5,000 bootstrap samples. If the 95% CI for the indirect effect did not include 0, we concluded that there was a significant mediation (Hayes, 2009). The mediation analysis was adjusted for caregiver's age, employment status, and caregiving hours.

Results

Sample Characteristics

The characteristics of study participants are presented in Table 1. The average age of family caregivers in our sample was 54.43 years ($SD = 13.60$; range = 25–85 years). Participants were predominantly female family caregivers (87.1%; $n = 61$). The majority self-identified as White (70.4%; $n = 50$) and had a college degree (81.4%; $n = 57$). One-third of participants (35.2%; $n = 25$) were unemployed at the time of answering the survey, and some (20%; $n = 14$) indicated a change in their employment since the beginning of the pandemic. Approximately two-third of our participants were (61.4%; $n = 43$) living with the care recipient. More than half of our participants were children caring for a parent (57.1%, $n = 40$), 24.3% ($n = 17$) were the spouse/partner of the care recipient, and 18.6% ($n = 13$) were caring for another family member or friend. Nearly half of our participants (47.1%, $n = 33$) reported spending more than 20 hours every week on caregiving activities. On average, participants have been providing care to their loved one for 8.10 years ($SD = 8.30$, range = 1–40 years).

The average age of care recipients was 72.38 ($SD = 19.82$; range = 18–97 years) and nearly half of care recipients were male (51.4%, n = 36). The care recipients' conditions that were most frequently reported by our participants included cardiovascular disease (65.7%, $n = 46$), arthritis (48.6%, $n = 34$), dementia (34.3%, $n = 24$), diabetes (28.6%, $n = 20$), and mental health conditions (20%, $n = 14$).

Approximately half of our participants (51.4%, $n = 36$) rated their caregiving stress during the COVID-19 pandemic as very stressful or extremely stressful. Less than half (41.4%, $n = 29$) reported having very good or excellent health.

Bivariate Analysis

We examined the relationships among caregiving stress, resourcefulness, and self-rated health to determine the direction, magnitude, and significance of the associations. Caregiving stress during the COVID-19 pandemic had a weak negative correlation with resourcefulness ($r = -.216$, $p = .073$) and a moderate negative correlation with self-rated health ($r = -.416$, $p < .001$). Resourcefulness had a moderate positive correlation with self-rated health ($r = .483$, $p < .001$).

Hierarchical Multiple Regression Analysis

Results for the hierarchical multiple regression are summarized in Table 2. The overall regression was statistically significant, $R^2 = .353$, adjusted $R^2 = .302$, $F(5, 64) = 6.970$, $p < .001$. Approximately 30% of the variance in self-rated health was accounted for by the five variables in the final model. The covariates (age, employment status, caregiving hours) were included in Step 1 but were not significantly associated with self-rated health. Caregiving stress was entered in the second step and significantly increased the R^2. Lastly, resourcefulness significantly increased the R^2 when it was entered in Step 3. Caregiving stress during the COVID-19 pandemic and resourcefulness had similarly important predictive contributions to self-rated health. Increased levels of caregiving stress during the pandemic were associated with lower ratings of self-rated health ($\beta = -.335$, $p = .003$), whereas increased levels of resourcefulness were associated with better self-rated health ($\beta = .373$, $p = .001$).

Mediation Analysis

From a simple mediation analysis conducted using ordinary least squares regression, caregiving stress during the COVID-19 pandemic indirectly influenced self-rated health through its effect on resourcefulness. As can be seen in Table 3, higher levels of caregiving stress were associated with lower levels of resourcefulness ($a = -4.792$) and lower levels of resourcefulness were associated with lower ratings of self-rated health ($b = 0.021$). A 95% bias-corrected bootstrap confidence interval for the indirect effect through resourcefulness ($a \times b = 0.099$) based on 5,000 bootstrap samples was entirely below zero [−0.230, −0.010], meaning that there was evidence of an indirect effect of caregiving stress during the pandemic on self-rated health through resourcefulness.

Discussion

In this study, we found that caregiving stress during the COVID-19 pandemic and resourcefulness were significant predictors of self-rated health among family caregivers of adults with chronic and/or disabling conditions. Moreover, the mediation analysis revealed that resourcefulness mediated the relationship between caregiving stress and self-rated health. Our findings provide insight into an underlying mechanism that can be targeted

to support family caregivers in times of crises and help them manage their stress during and beyond the COVID-19 pandemic.

Our participants had high levels of caregiving stress during the pandemic, and their stress level was negatively associated with their global health rating. Other investigators have documented the influence of the pandemic and its associated restrictions on the health of family caregivers. On average, family caregivers spent more time on caregiving tasks during the pandemic and they were moderately limited in their ability to provide care to their loved ones (Sheth et al., 2021). Moreover, the COVID-19 limitations on caregiving were associated with lower caregiver self-efficacy, higher depressive symptoms, and higher levels of stress (Sheth et al., 2021). Using qualitative methodology, Lee et al. (2020) found that Chinese family caregivers of stroke survivors have worsened physical and psychological well-being due to the reduced access to formal and informal support during the pandemic. The limited access to supportive services during the pandemic led many family caregivers to assume added responsibilities, which can be detrimental to their well-being. In fact, the level of care complexity has been associated with physical and mental quality of life among individuals caring for a family member or a non-family member in Serbia (Todorovic et al., 2020). The current literature highlights the short-term effects of the pandemic on the daily lives and well-being of family caregivers. Future research is needed to establish the long-term consequences of the pandemic and the associated changes in caregiving needs.

The mediating effect of resourcefulness established in this study is consistent with the findings of Guo et al. (2019) about the mediating role of resourcefulness between perceived stress and depressive symptoms in a sample of stroke survivors. Similarly, in a study of family caregivers of persons with dementia, Zauszniewski et al. (2018) found that resourcefulness mediated the effects of frequency of care recipients' depressive symptoms on caregivers' depressive symptoms. The psychological and behavioral symptoms of dementia are considered a primary source of stress for family caregivers (Pearlin et al., 1990). Our results are interpreted in the context of a global health crisis and are comparable to those of other studies that were conducted prior to the COVID-19 pandemic. Regardless of the source and context of stress, resourcefulness is an important mechanism that explains the influence of stress on caregivers' outcomes, more specifically their mental health outcomes. According to Resourcefulness Theory, stress can influence quality of life indicators directly, or through its indirect effect on resourcefulness (Zauszniewski, 2012). Therefore, our findings further support the theory and extend its use to the context of a global health crisis to better understand factors that contribute to family caregivers' mental health.

The mediating effect of resourcefulness also underscores the importance of a resourcefulness training intervention to manage the stress associated with caregiving during the COVID-19 pandemic. The mean resourcefulness score that our participants reported during the pandemic is similar to what has been previously reported in the caregiving literature (Toly & Musil, 2015; Zauszniewski et al., 2016; Zauszniewski et al., 2014). On average, our participants are considered to have a moderate need for a resourcefulness training intervention (Zauszniewski et al., 2012), which can be adapted to address the changing needs of family caregivers during the pandemic.

In a recent report from the Caregiving Transitions Study, Haley et al. (2020) found that family caregivers are at an increased risk for developing clinically-significant depressive symptoms after their transition to a caregiving role, compared to a matched sample of noncaregiving individuals. Individuals with mental health conditions are more negatively affected by the COVID-19 pandemic and its restrictions (Asmundson et al., 2020). Therefore, there is a critical need to address family caregivers' stress and mental well-being, especially because their caregiving responsibilities have changed since the beginning of the pandemic. Resourcefulness skills help family caregivers deal with adversity as they recover from the psychological effects of the pandemic by using cognitive-behavioral strategies as well as seeking assistance from others. Until then, healthcare providers and community health workers can direct family caregivers to appropriate resources and support groups so they can expand their coping repertoire and social network.

Our study has some limitations. Our study included a small convenience sample of family caregivers with high levels of education and access to technology to participate in the electronic survey. Our findings may not be generalizable to other family caregivers with a different socioeconomic background. Moreover, the single-item caregiving stress measure used in this study may not fully represent the complex theoretical construct of caregiving stress. However, it can provide useful information about the overall level of stress that is related to providing care while minimizing participant burden in the context of the pandemic. Additionally, the cross-sectional design of the study limits our ability to examine how family caregivers' stress has changed as a result of the pandemic, and whether the change in caregiving stress is associated with resourcefulness and health outcomes. Lastly, there may be other psychosocial mechanisms that explain the relationship between stress and outcomes. Despite these limitations, our study is among the first to identify a target for interventional work that can improve the health of family caregivers during and beyond the COVID-19 pandemic.

Caregiving stress during the COVID-19 pandemic and resourcefulness are associated with self-rated health among family caregivers of community-dwelling adults with chronic and/or disabling conditions. Moreover, resourcefulness was found to be a mediator between caregiving stress and self-rated health, suggesting the potential benefit of a resourcefulness training intervention to improve well-being among family caregivers during times of crisis.

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Table 1

Characteristics of Study Participants (N = 70)

Variables	*M* ± *SD*	*n* (%)
Age (in years)	54.43 ± 13.60	
Gender		
Female		61 (87.1)
Male		9 (12.9)
Race		
White		49 (70)
Non-White		21 (30)
Ethnicity		
Hispanic/Latinx		3 (4.3)
Not Hispanic/Latinx		67 (95.7)
Marital/Relationship status		
Married/in a relationship		45 (64.3)
Not Married		25 (35.7)
Education		
High school degree		2 (2.9)
Some college (no degree)		11 (15.7)
Associate degree		5 (7.1)
Bachelor's degree		21 (30)
Graduate degree		23 (32.9)
Doctoral degree		8 (11.4)
Employment status		
Employed		45 (64.3)
Unemployed		25 (35.7)
Employment change during pandemic		
Lost job		2 (2.9)
Furloughed/leave of absence		4 (5.7)
Reduced work hours/income		3 (4.3)
Other		5 (7.7)
Not applicable		56 (80)
Years as caregiver [a]	8.10 ± 8.30	
Relationship to care recipient		
Child		40 (57.1)
Spouse/Partner		17 (24.3)
Other family member or friend		13 (18.6)
Co-residence status		
Co-residing caregiver		43 (61.4)
Distant caregiver		27 (38.6)
Caregiving hours per week		

Variables	*M* ± *SD*	*n* (%)
≤ 20 hours		37 (52.9)
> 20 hours		33 (47.1)
State of residence [a]		
Midwest		37 (52.9)
West		17 (24.3)
South		12 (17.1)
Northeast		3 (4.3)
Caregiving stress (range 1–5)	3.61 ± 0.98	
Resourcefulness (range 0–140)	86.63 ± 17.21	
Self-rated health (range 1–5)	3.30 ± 0.95	

Note.

[a] $n = 69$.

Table 2

Hierarchical Regression Analysis Predicting Self-Rated Health

	Self-rated health					
	Step 1		**Step 2**		**Step 3**	
	***B* (*SE*)**	**β**	***B* (*SE*)**	**β**	***B* (*SE*)**	**β**
Age	.001 (.009)	.010	−.007 (.008)	−.106	−.001 (.008)	−.020
Employment status	.421 (.258)	.213	.387 (.235)	.196	.243 (.222)	.123
Caregiving hours	−.156 (.238)	−.082	−.014 (220)	−.007	−.038 (.204)	−.020
Caregiving stress			−.424 (.111) **	−.437 **	−.325 (.107) *	−.335 *
Resourcefulness					.021 (.006) *	.373 *
***R*²**	.062		.235		.353	
Adjusted *R*²	.019		.188		.302	
Δ*R*²			.173		.118	
***F* (for model)**	1.456		4.993 *		6.970 **	

Note. *B*: unstandardized estimate, *SE*: standard error, β: standardized estimate, ΔR^2: change in R^2.

* $p < .01$,

** $p < .001$.

Table 3

Mediating effects of resourcefulness on the relationship between caregiving stress during the COVID-19 pandemic and self-rated health

	Self-rated health		
Effect	***B* (*SE*)**	***p***	**95% CI**
a: Effect of caregiving stress on resourcefulness	−4.792 (2.098)	.026	−8.982, −0.602
b: Effect of resourcefulness on self-rated health	0.021 (0.006)	.001	0.009, 0.033
c: Total effects of caregiving stress on self-rated health	−0.424 (0.111)	<.001	−0.645, −0.203
c': Direct effects of caregiving stress on self-rated health after adjustment for resourcefulness	−0.325 (0.107)	.003	−0.538, −0.112
a × b: mediating effect of resourcefulness	−0.099 (0.057)		−0.230, −0.010

Note. Model adjusted for age, employment status, and caregiving hours. Number of bootstrap samples: 5,000.

B: Unstandardized coefficient, *SE*: standard error, CI: confidence interval.